ATTACHMENT, ILLNESS PERCEPTIONS, AND HEALTH OUTCOMES: THE MEDIATING ROLE OF SUPPORT SEEKING, SUPPORTIVE, AND NEGATIVE INTERACTIONS IN COUPLES EXPERIENCING TYPE 2 DIABETES

A thesis submitted in partial fulfillment of

The requirements for the Degree

of Doctor of Philosophy in Psychology

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2015

To Papa and Mama,

for showing me what it really means to love each other in sickness and in health

To my husband and our daughter,

for your support and love

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ACKNOWLEDGEMENTS

I was once told that writing a thesis was like writing a story. I agree, but I also believe that there is another story behind every thesis story; a more personal one. As for me, the story behind my thesis is one full of difficult decisions, of having to say goodbye, and of being almost there but not yet there. Interwoven in these heartaches, however, are wise counsel, comfort, encouragement, hope, and love. Now that I have finished my thesis, all that remains of my story is a thankful heart. To all those who have played a role in my story, thank you for sacrificing a part of yourself for me to complete my thesis. I pray that you will be blessed in the same way that you have blessed me.

For being my supervisor through and through, Roeline, I sincerely thank you. You are one great mentor. You have maintained a professional stance—being prompt, thorough, precise, and honest—in our relationship; yet, I have always felt your kindness and graciousness. I will always be grateful to you for teaching me the ins and outs of research. Thank you for being my mentor each step of the way—from when I was writing my proposal, when I was recruiting my participants, to when I was writing my final draft. Thank you for being generous with your ideas, time, research resources, and advice. Thank you for the hard work you have invested in supervising my thesis journey. Most of all, thank you for assuring me that you would not let me not finish my thesis.

Garth, thank you very much for teaching me SEM and growth curve analysis. Thank you for going through my thick pile of SPSS outputs and discussing each one with me. Thank you for your valuable input, especially in the statistical analyses I conducted. Thank you for making time to meet with me to discuss my statistical results even when it was a really busy time for you.

A special thanks to my participants. My sincerest gratitude to all of you for generously giving your valuable time as you took part in my study.

To my UC friends, Health Laboratory mates, roommates, and the UC Department of Psychology staff; thank you for making my stay in UC less daunting and for showing me Kiwi hospitality.

To our housechurchmates, you are our second family. Thank you for welcoming us into your lives. Thank you for standing with us in prayer. Nana Carolyn, thank you for taking good care of us. Margaret, Clifford, and Mieka, thank you for being a big part of our NZ life; we hope to

see you again soon. Brendan and Kathryn, we could not thank you enough for opening your home and hearts to us.

To our Filipino brothers and sisters in Christ, and our Filipino community, *maraming salamat po* for inviting us to be part of your loving community, for the friendship, laughter, and the home-cooked Filipino meals and desserts. To our brothers and sisters in Christ back home, thank you very much for bringing forth words of encouragement and for being our prayer warriors. To my dear friends, thank you for your understanding and support.

To my UP Department of Psychology friends, colleagues, and the department staff; thank you very much for keeping in touch and for taking the extra load while we were away. To the department heads: Ma'am Betty, Ma'am Peachy, Ma'am Grace, and Ma'am Mita; thank you very much for your support.

To the University of the Philippines Diliman, I am extending my gratitude for granting me (and my husband) the Doctoral Studies Fund, without which it would be very difficult for us to pursue our postgraduate degree.

To our families whom we missed so much while we were away, thank you very much for the blessings and prayer. *Tatay* Ruben, thank you *po* for making sure that our tuition will be paid on time. *Nanay* Minda and *Nanay*, thank you very much *po* for praying for us without ceasing. To, Bok, thank you very much for helping me go through the list of references and make sure that all were properly accounted for. Papa, thank you for teaching me that learning is a lifetime endeavor. Mama, thank you for believing in me. I love you very much.

To my joy, the two people most precious to me, who have sacrificed the most, encouraged me the most, and prayed for me the most; my husband and our daughter. Aila, *anak*, thank you very much for your encouraging words, for your sweet and thoughtful notes, for lifting my spirits up whenever I am not in the mood to crack a joke. *Mahalko*, thank you very much for everything. I was amazed at how you took interest, and had a good understanding of, what I was doing. Thank you for being patient with me, for holding my hand throughout this journey, and for your unending support. Not even once did you doubt that, by God's grace, I would be a finisher. Thank you for being with me in good times and in thesis times. Thank you for loving me unconditionally. Also, to our wee babies, Arlo and Amli, *Ina* loves you two very much.

Above all, my heavenly Father, thank You for seeing me through. You have allowed me to experience your presence in my moments of neediness and dependence. Your word kept me going. You are my wisdom and my hope. You have allowed me to see and taste Your goodness. I was able to finally finish my thesis only because of Your grace and love. I am one with the psalmist in declaring "Not to us, O LORD, not to us, but to Your name be the glory because of Your love and faithfulness" (Psalm 115:1).

ABSTRACT

This thesis used attachment theory and the common sense model of illness as theoretical backgrounds to examine the mechanisms that contribute to the quality of the support seeking behaviour and social interactions between patients with type 2 diabetes and their partners. Specifically, this thesis examined actor and spouse effects of working models of attachment on health outcomes, and illness perceptions on health outcomes for both patients and partners. Furthermore, it determined if support seeking, supportive interactions, and negative interactions mediated between the attachment and health outcomes and illness perception and health outcomes. At study entry, 70 patients with type 2 diabetes and their partners completed measures on attachment, illness perceptions, support seeking, receipt of supportive interactions and of negative interactions, satisfaction with support received, and health outcomes. Health outcomes included psychological distress and physical health for patients and partners, and diabetes well-being for patients only. Six months later, participants again completed measures on supportive and negative interactions, satisfaction with support received, and health outcomes. The data were examined both cross-sectionally (including mediational analyses) and longitudinally. The cross-sectional analyses revealed a number of actor and spouse effects in the relationships between attachment and health outcomes, and illness perceptions and health outcomes. Patients who scored higher on attachment-anxiety experienced higher levels of psychological distress and lower levels of diabetes well-being. Also, the partners of these patients experienced higher levels of psychological well-being. Furthermore, covert support seeking behaviour and negative interactions were found to be significant mediators between patient attachment-anxiety and patient psychological distress and diabetes well-being. In addition, support satisfaction mediated the relationship between

patient attachment-anxiety and patient psychological distress. Illness perceptions, specifically timeline cyclical perceptions, were also shown to be related to health outcomes, and receipt of negative interactions. Patients and partners who scored higher on timeline cyclical experienced higher levels of psychological distress. Also receipt of negative interactions mediated the relationship between timeline cyclical and psychological distress. Some significant changes over time found when the data were examined longitudinally. For example, patients who scored higher on attachment-anxiety at study entry experienced higher levels of psychological distress over time, and had a partner who also experienced higher levels of psychological distress over time. In addition, partners who scored higher on personal control and who had a spouse (patient) who scored higher on timeline cyclical at study entry experienced higher levels of psychological distress overt time. Taken together, both the cross-sectional and longitudinal findings emphasize the contribution of the partner and his or her interactions with the patient to patient well-being. In the same manner, the results also highlight the effect of the patient's illness on the partner's well-being. These findings have important practical implications, especially for practitioners who aim to design intervention to help patients and their partners better adapt to the patient's illness.

1. Living with a Chronic Illness: Diabetes Mellitus

1.1.Overview

"In sickness and in health…" Many couples make this vow at the beginning of a permanent relationship, and in times of sickness partners may have to fulfill their promises. Being involved in a supportive relationship may play a key role in successful adaptation to chronic illness (Sarason, Sarason, & Gurung, 2001). This thesis focuses on couples in which one partner has been diagnosed with type 2 diabetes.

In New Zealand (like most other countries in the Western world) the prevalence of type 2 diabetes has increased substantially over the past two decades and is expected to increase further. The World Health Organization estimates that 347 million people worldwide have diabetes (World Health Organization, 2013). In New Zealand, where an estimated 200,000 people have been diagnosed with diabetes (Ministry of Health, 2012), the government has recognized that diabetes is a major health risk, thus working on the reduction of its occurrence and effects has been one of the 13 top priorities of the New Zealand Health Strategy since 2003 (New Zealand Guidelines Group, 2003).

The vast majority (around 85-95%) of patients diagnosed with diabetes are diagnosed with type 2 diabetes (American Diabetes Association, 2013; Ministry of Health, 2012). Management of type 2 diabetes depends almost entirely on behavioural self-regulation (Gonder-Frederick, Cox, & Ritterband, 2002) and patients must perform a number of daily self-management tasks in order to control their diabetes. Adequate self-management is important because poorly controlled type 2 diabetes is associated with serious long-term health consequences. In order to be able to perform the required self-management tasks

patients may need support and help from their spouse. However, not all support attempts may be helpful and some research suggests that not everyone benefits from support to the same extent.

The importance of studying the role of spouses in diabetes management has been emphasized by a number of researchers (e.g., Gonder-Frederick, Cox, & Ritterband, 2002), but relatively few have actually done so. This thesis aims to examine the underlying mechanisms that determine the quality of social support interactions among couples in which one partner has been diagnosed with type 2 diabetes.

1.2.Type 2 diabetes

Diabetes mellitus is one of the illnesses of this century that has become of great concern to the health community. Diabetes is a chronic disorder which involves the endocrine system and is primarily a result of anomalies in the body's production and utilization of insulin (Gonder-Frederick, Cox, Clarke, Christensen, & Antoni, 2002). Insulin is a hormone produced by cells in the pancreas; a sufficient amount of this hormone is needed by most cells for normal metabolism of glucose (Gonder-Frederick, Cox, Clarke, et al., 2002). In diabetes, inadequate insulin secretion, abnormalities in insulin action, or both lead to unusually elevated blood glucose levels— a condition known as hyperglycaemia (American Diabetes Association, 2013).

Diabetes can be grouped in four classes: type 1diabetes, type 2 diabetes, gestational diabetes, and other types which result from different causes (American Diabetes Association, 2013). Type 2 diabetes is the most common form of diabetes. According to the American Diabetes Association, around 90 to 95% of individuals with diabetes have type 2 diabetes.

The research in this thesis focuses on patients with type 2 diabetes only. Type 1 diabetes is characterized by an auto-immune destruction of β cells of the pancreas and an absolute insulin deficiency, while type 2 diabetes results from insulin resistance (American Diabetes Association, 2013). In type 2 diabetes the insulin deficiency is relative (not absolute), and treatment does not necessarily require patients to take insulin. In general, old age, obesity, and minimum physical activity are risk factors for acquiring type 2 diabetes. Furthermore, gestational diabetes, hypertension, belonging to certain ethnic groups, and genetic predisposition are associated with higher risks of getting type 2 diabetes (American Diabetes Association, 2013).

1.2.1. Prevalence and costs

The burgeoning number of patients diagnosed with diabetes is alarming. Currently, 347 million people worldwide are estimated to have diabetes (World Health Organization, 2013), and this number is predicted to increase to around 552 million people by the year 2030 (International Diabetes Federation, 2013). These estimates include both diagnosed and undiagnosed cases. Early symptoms of type 2 diabetes in particular are not easily recognized and the International Diabetes Federation (2013) estimates that globally as many as half of those who have diabetes are unaware of their condition. In addition, according to the World Health Organization (2013), by the year 2030 diabetes will be the seventh leading cause of death.

In New Zealand, there has been a gradual increase in the rate of diagnosed diabetes from 3.8% of adults in 1996/1997 (New Zealand Guidelines Group, 2003) to 5.5% of adults in 2011/2012 (Ministry of Health, 2012). It is estimated that in New Zealand the rate of undiagnosed diabetes is 25% (i.e., for every 3 diagnosed cases, there is one undiagnosed case;

Ministry of Health, 2012 In New Zealand. Men, people aged 55 and older, Pacific people, and people in more deprived areas (compared to women, individuals younger than 45 years, non-Pacific people, and those in more advantaged areas, respectively), are more likely to have been diagnosed with diabetes (Ministry of Health, 2012).

Having diabetes is costly, not only for the patients, but for their families and for the health care system as well. Diabetes puts a large financial burden on the health care system. The International Diabetes Federation (2013) estimates that US$ 465 billion was spent on diabetes-related health care in 2011 alone (see also Caro, Ward, & O'Brien, 2002; O'Brien, Shomphe, Kavanagh, Raggio, & Caro, 1998). A study by Caro et al. (2002) has estimated that 30 years of managing complications of diabetes could reach around US$ 47, 240 for each patient. A big portion of this amount goes to treating macrovascular diseases such as stroke, transient ischemic attack, myocardial infarction, and angina (Caro et al., 2002).

1.2.2. Medical outcomes and self-management

Diabetes, being a chronic illness, cannot be cured; it can only be managed (Gonder-Frederick, Cox, Clarke, et al., 2002). Poorly controlled diabetes is associated with a number of long-term health consequences. To complicate matters even more, comorbidity is another problem for type 2 diabetes patients, as one medical condition may lead to another. For example, patients with retinopathy and advanced cortical cataract are at higher risks of having a fracture (Ivers, Cumming, Mitchell, & Peduto, 2001). In fact, comorbidities are the primary reason that type 2 diabetes patients utilize more hospital care than do individuals without diabetes (Olveira-Fuster et al., 2004).

Hyperglycaemia or having very high glucose levels, which is usually a consequence of ill-managed type 2 diabetes, is related to most long-term health consequences and

comorbid illnesses experienced by type 2 diabetes patients. Studies show that recurring hyperglycaemia is related to enduring impairment and malfunction of different organs such as the eyes (Fong, Aiello, Ferris, & Klein, 2004; Henricsson et al., 2003; Orcutt, Avakian, Koepsell, & Maynard, 2004), kidneys (Melville, Richardson, Lister-Sharp, & McIntosh, 2000), nerves, liver, heart, and blood vessels (American Diabetes Association, 2007).

The patient's primary goal, therefore, in managing type 2 diabetes is to keep their blood glucose levels as close to normal as possible. The American Diabetes Association (2013) suggests that the HbA1c goal for most adults is <7%. The measurement of the individual's glycated haemoglobin, or HbA1c, level in the blood is one of the more common means of evaluating one's glycaemic control. HbA1c is the average glycaemic level of the individual for the past two or three months. The American Diabetes Association (ADA), the International Diabetes Federation (IDF), and the UK National Institute for Clinical Excellence (NICE) advise that HbA1c should be regularly monitored, at least every six months for those who meet the recommended levels and more frequently (quarterly) for those who do not (Massi-Benedetti, 2006).

Towards the end of maintaining a blood glucose level as close to normal as possible, patients are advised to follow a prescribed diet, increase physical activity, take oral medication (or inject insulin, for some), regularly check blood glucose level and be vigilant for symptoms of hypoglycaemia or hyperglycaemia. In addition, because of the strong association between type 2 diabetes and obesity, most patients are also advised to lose weight. Patients with type 2 diabetes, therefore, need to perform multiple self-management behaviours on a daily basis for the rest of their lives (Ciechanowski, Katon, & Russo, 2005; Gonder-Frederick, Cox, Clarke, et al., 2002). The American Diabetes Association (ADA) advises that a team of health practitioners, led by medical doctors, oversee the patients'

medical treatment. Some of the recommended members of the team (other than doctors), are doctors' assistants, nurses, pharmacists, dietitians, and mental health professionals, all of whom specialize in diabetes. Health practitioners can give instructions on what needs to be done, but after leaving the health practitioner's clinic, the patients are in charge of managing their illness and adequate self-management is ultimately their responsibility.

Daily diabetes management calls for self-regulation and self-control, which can be daunting and overwhelming for patients. To add to this difficulty, it is also possible for patients who feel they are not in control of their daily chores to also think of themselves as inadequate in managing their illness (Manderson & Kokanovic, 2009). Indeed, it is not easy for patients with type 2 diabetes to perform all the necessary tasks by themselves; assistance from others, especially from the partner, could prove beneficial.

1.2.3. Psychological outcomes

Living with type 2 diabetes can be burdensome. Coping with the illness day in and day out and having to think about what needs to be done almost constantly, can be very taxing. This experience can be draining and exhausting of physical as well as psychological resources. It is not surprising then, that patients with diabetes, compared to the general population, experience more psychological distress (Aguilar-Zavala, Garay-Sevilla, Malacara, & Perez-Luque, 2008; Cohen & Kanter, 2004), are more stressed (Fisher, 2006), complain of more somatic symptoms (Cohen & Kanter, 2004; Engum, Mykletun, Midthjell, Holen, & Dahl, 2005), and report being more anxious and hostile (Cohen & Kanter, 2004). For example, in a study done by Cohen and Kanter (2004), participants with type 1 or type 2 diabetes experienced more psychological distress than participants without diabetes.

There is also evidence that patients with diabetes, compared to the general population, are at greater risk of being depressed (Cohen & Kanter, 2004; de Groot, Anderson, Clouse, Freedland, & Lustman, 2001; Egede, Zheng, & Simpson, 2002; Engum et al., 2005; Fisher, 2006). After conducting a meta-analysis using 39 studies, Anderson, Clouse, Freedland, and Lustman (2001) estimated that patients with diabetes were twice as likely to develop depression compared to non-patients. However, it is more likely that having comorbid conditions, instead of diabetes itself was the factor that increases the risk for being depressed among patients type 2 diabetes (Engum et al., 2005). It must be noted, though, that most diabetes patients were exhibiting depressive symptoms which for the most part were not clinically significant (Fisher et al., 2007). For type 2 patients who were diagnosed with clinical depression, there is a greater risk of having multiple depressive episodes (McKellar, Humphreys, Piette, 2004, p. 486). Aside from increasing health care utilization and costs (Egede et al., 2002), depression in patients with diabetes, compared with individuals without diabetes, increases the likelihood of death caused by different factors related to diabetes (Egede, Nietert, & Zheng, 2005; Zhang et al., 2005).

Patients with type 2 diabetes face a complicated situation. Their psychological well-being affects the way they respond to the challenges of self-management (Dharmalingam, 2005; Egede et al., 2005; McKellar et al., 2004). For example, patients who are depressed are less likely to maintain the recommended glucose level, follow a strict medication regimen (Egede et al., 2002; Fisher, 2006; McKellar et al., 2004), and keep to a recommended dietary plan (McKellar et al., 2004). In addition, more depressed patients experience a poor quality of life (Egede et al., 2002; Fisher, 2006). Furthermore, it was shown that being stressed is an obstacle to good adherence (Fisher, 2006). As a consequence of poor self-management,

patients experience more diabetes symptoms, such as hyperglycaemia and hypoglycaemia, and microvascular problems (McKellar et al., 2004).

It is clear that there is a strong relationship between having diabetes and experiencing depression. Further study is needed, though, to examine the direction of this relationship: Do diabetes complications lead to patients being more depressed or does depression in patients exacerbate their medical condition, thus facilitating the development of different complications? (De Groot et al., 2001).

Because of the important role played by patients' psychological well-being in effectively managing the illness, the other goal of diabetes care, aside from lowering glucose levels and averting complications, is to look after the patients' psychological welfare and make sure that they are coping well with the illness (Debono & Cachia, 2007).

1.3.The Partner experience

The diabetes experience is shared by the patients' partners; partners also feel the strain of the illness. Partners also need to adjust to and cope with the changes brought about by their spouse's illness, thus partners also require support in dealing with these challenges (Stodberg, Sunvisson, & Ahlstrom, 2007). Someone who is married to (or in an intimate relationship with) a patient with diabetes faces his or her own set of challenges: worrying about the medical consequences (to the patient) of the illness (Sabone, 2008; Stodberg et al., 2007), helping the patient during bouts of hypoglycaemia (Trief et al., 2003), helping the patient manage their illness (Trief et al., 2003), dealing with the patient's temper (Sabone, 2008), having to adjust to the social constraints brought about by the illness (Stodberg et al., 2007), and facing relationship and intimacy problems (Sabone, 2008).

Physical consequence of diabetes, such as fatigue and loss of sight were sources of worry not only for patients but for partners as well (Sabone, 2008). Partners also fear for the patient's future health as they think of the possible medical consequences to the patient of the illness. There is uncertainty as to what will happen. As an example, in the study conducted by Stodberg et al. (2007), partners of patients with diabetes believed that developing complications was inevitable and that it was just a matter of time before the patient would experience such complications. Furthermore, the thought that diabetes was an illness that could not be cured was disturbing for these partners. These partners were also thinking about the possibility of that the patient's diabetes would be genetically passed on to their children (Stodberg et al., 2007).

When hypoglycaemia episode occurs, patients experience dizziness, confusion, and physical weakness. Partners dread the thought of the patient experiencing such an attack, especially it leading to loss of consciousness; thus partners are on their toes looking for signs of hypoglycaemia before it happens and trying to keep such an incident from happening. Partners find it difficult to talk sense to and to help the patient who is experiencing a hypoglycemic reaction (Stodberg et al., 2007; Trief et al., 2003). Partners also find it challenging to be involved with managing the patient's diabetes. On the one hand, partners want to help the patient adhere to their practitioner's recommendations with regard to diet, blood monitoring, and physical activity. On the other hand, partners need to balance this desire to help with the knowledge that a reminder can be regarded as being demanding and controlling (Stodberg et al., 2007; Trief, Himes, Orendorff, & Weinstock, 2001; Trief et al., 2003). Most partners in a study conducted by Trief et al. (2003) acknowledged that "nagging" only elicited negative reactions from the patient.

Partners also need to adjust to changes in their social life. For example, partners of patients with diabetes in Sabone's (2008) study mentioned that they could not go out with their social circle as often as they used to because they did not want to leave the patient at home by themselves. They also reported having to adjust their work schedule at times in order to look after their ill partner.

Aside from the abovementioned concerns with the partners' psychological well-being, they also encounter physical health concern: partners of patients with type 2 diabetes have a higher risk of developing diabetes themselves. This may be due to the same environment—same food and level of physical activity—shared by patient and partner. Furthermore, partners have been shown to have "higher blood pressure, higher levels of serum triglycerides, and higher BMI", compared to the general population (Khan, Lasker, & Chowdhury, 2003). Despite its importance, not much research has been done to look at the experiences of partners of type 2 diabetes patients and this is one of the objectives of the current study.

2. Social support, Attachment, and Illness perceptions

Many studies have described the beneficial effects of spousal supportive behaviours on well-being in general, as well as on adjustment to chronic illness (e.g., Cutrona, 1996; Kleiboer, Kuijer, Hox, Schreurs, & Bensing, 2006; Kuijer et al., 2000). However, not all supportive interactions from the spouse are helpful. The overarching aim of this thesis is to examine the underlying mechanisms that determine the quality of social support interactions between patients with type 2 diabetes and their partners. The current study uses attachment theory (Bowlby, 1988) and the common sense model of illness (Leventhal, Diefenbach, & Leventhal, 1992) as theoretical backgrounds to study the underlying social support mechanisms.

In this chapter I will first define social support and give a brief overview of how social support is related to coping with illness (and diabetes in particular), and how social support is related to outcomes in both patients and partners. As social interactions are not always positive, I will also pay attention to negative spousal interactions. I will then outline attachment theory and discuss how it can be used to understand the process of support seeking and support giving in couples coping with chronic illness. Finally, I will outline the common sense model of illness and will discuss how the illness perceptions held by patients and their partners may influence social support outcomes and health-outcomes in both partners.

2.1.Social Support

According to Wills and Fegan (2001) social support can be defined as "resources provided by others that may be useful for helping a person with a problem" (p 209). In a similar vein, Cohen (2004) defines it as referring to a "social network's provision of psychological and material resources intended to benefit an individual's ability to cope with stress" (p 676). The provider of the resource may be anybody from the recipient's social network circle (Cohen, 2004). He or she may be a spouse or an intimate partner, a child or other family member, a friend, a co-worker, a church mate, or an acquaintance from the community. In the current study, the focus is on the spouse or intimate partner as the support provider. Two elements in the definitions of support above are important to mention: First, the end goal of providing support is generally not to solve the problem for the recipient or to remove the recipient from the problematic situation, but to help the person deal with the problem, which may be any kind of distressing or threatening situation that the recipient is facing (Cohen & Kanter, 2004; Wills & Fegan, 2001). Second, both definitions are tentative about the effect of social support. That is, Wills and Fegan (2001) caution that social support "*may* be useful for helping", whereas Cohen (2004) states that "resources are *intended* to benefit" making it clear that although well-intended , social support may not always be advantageous to the recipient (Coyne & Smith, 1994; Kuijer et al., 2000). This will be discussed in more detail later (see Section 2.2.3).

Based on the different functions that supportive behaviours may serve, different classifications of support are often described (Wills & Fegan, 2001). Although the categories proposed by different researchers differ substantially, most authors focus on the distinction between instrumental support and emotional support (e.g., Collins, Dunkel-Schetter, Lobel, &

Scrimshaw, 1993; Kleiboer et al., 2006). Instrumental support provides for the more practical and physical needs of the recipient. Emotional support, on the other hand, caters to the emotional needs of the recipient. Emotional support communicates that one is loved and cared for by showing affection, providing reassurance, and listening. In the context of chronic illness, both types of support are important (e.g., Helgeson & Cohen, 1996; Kleiboer et al., 2006).

It is important to distinguish between perceived (availability of) social support and received social support. Although both concepts are covered by the broader term of social support, received support refers to the actual support resources provided to the recipient, whereas perceived support refers to the recipient's appraisal of the support resources available to him or her in times of need (Haber, Cohen, Todd, & Baltes, 2007). Most researchers agree that measures of received support are better estimates of support transactions than perceived support measures, because individuals are asked to recall specific examples of behaviour over a certain time frame (e.g., over the past two weeks) (Haber et al., 2007). In contrast, it has been argued that perceived social support measures may not involve perceptions of actual support transactions, but reflect more general evaluations of the relationship or beliefs about the relationship with the provider. A meta-analysis by Haber et al. (2007) showed that perceived support and received support measures were only moderately correlated (average correlation of .35 over 23 studies) supporting the idea that these are different constructs. Moreover, a study by Cohen et al. (2005) showed that inter-observer consensus was much higher for received social support measures compared to perceived social support measures. In the current study, social support is measured as received social support.

Social support and coping, in the context of an illness, are intimately interconnected, hence Schreurs and De Ridder (1997) suggested that these two concepts be integrated and be studied simultaneously. These authors suggested four ways through which these constructs, social support and coping, could be examined as being related to each other: regard one's seeking of social support as a means of coping, view social support as a resource one can use to cope, consider social support as dependent on one's degree of coping with the illness; and situate social support and coping in the context of a social system (e.g., looking at the how couples cope with an illness) (Schreurs & De Ridder, 1997). Seeking social support is one of the means through which patients attempt to adapt to their illness; this coping strategy is often used by patients with chronic illness, specifically diabetes, multiple sclerosis, and cancer (Schreurs & De Ridder, 1997). Collins and Feeney (2000), who looked at the relation between caregiving and support seeking behaviours, distinguished between direct and indirect ways of seeking support. Direct ways of seeking help involve behaviours clearly expressing that one is in distress and directly requesting help. Indirect ways of seeking help involve behaviours hinting that one has a problem without directly asking for help (Collins & Feeney, 2000).

2.1.1. Spousal support

De Ridder, Geenen, Kuijer, and van Middendorp (2008), in their review of studies, found that being active, processing and expressing emotions well, effectively managing illness and positively re-appraising the situation would help patients experience better psychological adjustment to their illness. As patients make it their goal to follow each of these recommendations, there is an increased possibility of achieving this if they are working with someone. For most patients, the partner is the closest, most influential person and most

available source of support (Kiecolt-Glaser et al., 1996). The partner is important in helping the patient cope effectively with the emotional and psychological stressors brought about by the chronic illness (Martire, Schulz, Keefe, Rudy, & Starz, 2008). For example, Primomo et al. (1990) found that female patients reported receiving more support from their partners compared to other members of their social circle.

Although a number of studies have examined the different aspects of spousal support and found useful answers to questions with regard to its implications on the patients' coping with and recovery from an illness, the patients' physical health and psychological well-being, and the patients' quality of life; these answers opened up other interesting areas that need to be explored further. Spousal support mechanisms are not straightforward. It is not as simple as thinking that spousal support always positively influences the patients' health outcomes. There are various moderating and mediating variables influencing spousal support processes (Fekete, Stephens, Druley, & Greene, 2006). To complicate matters further, coping with serious illness in the relationship is a "dyadic affair" (Coyne & Smith, 1994): the patients' adjustment is affected by their partners' behaviour (e.g., social support provision) and adjustment, but the reverse is also true. For example, patient support may positively impact on partner well-being (see for example Kleiboer et al., 2006) which in turn may affect patient outcomes.

As patients and partners interact with each other on a daily basis, these interactions may either be positive or negative. Positive and negative interactions have been found in research to be independent of each other. This means that in a day's time, the couple may have positive and negative interactions. I will first discuss the effects of positive interactions on patients' and partners' well-being and then discuss the effects of negative interactions in a separate section.

2.1.1.1.Effect of partner support on the patient

Research has found that the patients' supportive interactions with their partners are predictive of the patients' health—both physical and psychological. Across different chronic illnesses, researchers have described the beneficial effects of spousal support on well-being in general as well as on adjustment to an illness in particular (e.g., Cutrona, 1996). For example, a study by Manne and Zautra (1989) found that female patients with rheumatoid arthritis who reported receiving more support from their husbands reported lower levels of psychological distress. This study also showed that the more frequent a husband provided support to his wife with rheumatoid arthritis, the more often the wife engaged in a coping strategy helping her realize the benefits from her current situation.

Several studies (see review by Berg & Upchurch, 2007) have shown that when the partner is actively engaged in dealing with the illness (e.g., by providing emotional and instrumental support), patients experience more positive daily moods, higher relationship quality, and better psychological adjustment. A partner who is actively engaged in a patient's illness is involved in each step of problem-solving relating to the patient's illness.

As outlined previously, different types or categories of social support can be distinguished. In this thesis, I will focus on the two main categories, that is, emotional and instrumental support. A study by Kleiboer et al. (2006), has suggested that it is important to distinguish between the effects of instrumental and emotional support, for they work differently to affect one's well-being.

Ample research has shown that emotional support from the spouse can have positive effects on patient outcomes. For example, Khan et al. (2009), in a longitudinal study, found that as spouses showed understanding and listened to the concerns of the patients who had

undergone surgery for knee replacement, the patients felt more confident to manage their illness over time. More specifically, patients who received more emotional support from their spouses at study entry (Time1), believed that they were better at managing the pain after surgery and that they could better adhere to their physician's recommendations three months after surgery (Time 2). In addition, at Time 2, the patients reported higher levels of both physical and psychological well-being. It was through the patients' increased self-efficacy that they felt better physically and psychologically over time. Similarly, in a study by Fekete et al. (2007), patients' perception of how their spouses responded to their emotional needs was shown to mediate the relationship between the emotional support provided by the spouses and the patients' psychological well-being. Using daily diary methodology, Kleiboer et al. (2006) showed that patients with multiple sclerosis reported better end-of-day mood when they had received emotional support from their spouses during the day.

The extent to which instrumental support is beneficial for patients is less clear. For example, in the study by Kleiboer et al., (2006) receiving instrumental support was unrelated to end-of-day mood among patients with multiple sclerosis, and was only related to higher self-esteem on days when patients had also provided instrumental support to their partner. On days that patients were unable to reciprocate, receiving instrumental support from their spouse was related to lower levels of self-esteem. This finding illustrates that receiving instrumental support may not always be beneficial. A review done by Helgeson and Cohen (1996) showed that a good number or cancer patients preferred emotional support more than other types of support (e.g., instrumental support). There is also evidence that emotional support is more strongly related to adaptation to illness outcomes than instrumental support (see also Cohen & Hoberman, 1983; Schaefer, Coyne, & Lazarus, 1981). However, most research examining the effects of social support in the context of illness either focuses

exclusively on emotional support only or combines emotional support and instrumental support into one measure. For example, Khan et al. (2013) showed that support from the spouse was positively related to physical activity in diabetes patients. Their social support measure consisted of two emotional support items and one instrumental support item making it impossible to draw any conclusion about the effectives of each type of support.

2.1.1.2.Partner's need for spousal support

The stress of having a chronic illness is shared by the couple; both patient and partner experience its burden. In a study by Eton, Lepore, and Helgeson (2005) levels of psychological distress and its contributing factors were examined in wives of patients with prostate carcinoma. It was found that patients and partners had the same levels of general distress; however, partners reported experiencing higher levels of cancer-specific distress (Eton et al., 2005). As Coyne and DeLongis (1986) emphasized, when a member of a couple is diagnosed with an illness, it is not only the patient who needs to make adjustments, but the partner needs to cope as well. Among the people around the patient, the partner is the most affected by the patient's illness. The partner sees how the patient experiences the illness, and feels the patient's pain; at the same time, the partner has struggles of his or her own. The partner needs to juggle different tasks of providing support, managing their stress, and managing the relationship. For example, a study by Park et al. (2013) on partners of coronary artery bypass (CAB) surgery patients showed that these partners were attending to taxing caregiving tasks such as being the patient's personal driver, doing extra household chores, and running some other errands.

In terms of the effect on the partner of supporting the patient, Beach, Schulz, Yee, and Jackson (2000) in their study found that as partners increased their support to their spouse

with disability, partners experienced better psychological well-being, specifically, they experienced lower levels of anxiety and depression. However, the authors also found that caring for a disabled spouse can lead to caregiver strain which in turn leads to lower levels of physical health (Beach et al., 2000).

Partners' psychological well-being and physical health are being affected, most of the time negatively, by the patients' illness. For example, in a study done by Kiecolt-Glaser et al. (1987) participants were family members who acted as caregivers to Alzheimer's disease patients and comparison participants who were matched in socio demographic characteristics. Family caregivers experienced higher levels of distress and had poorer immune system control compared to the comparison group. In another study, partners who took care of heart failure (HF) patients were found to have lower levels of quality of life (Luttik, Jaarsma, Veeger, & van Veldhuisen, 2005). In addition, the effect of the patients' illness on the partner's psychological well-being can last for some time. Son, Friedman, and Thomas (2012) found that post myocardial infarction (MI) patients' levels of depression predicted their partner's levels of depression two years after study entry. There was an increase in levels of depression, over the two-year follow-up period, for partners of patients who had higher levels of depression at study entry.

It is clear from the results of these studies that partners experience distress as they journey with the patients in dealing with the illness. It is then imperative that partners also receive social support. A study conducted by Baron, Cutrona, Hicklin, Russell, and Lubaroff (1990) had participants who were partners of patients with renal, bladder, prostate, or testicular cancer who were undergoing chemotherapy or radiation treatment or both. The researchers found that partners who perceived receiving more social support had more responsive immune functions. Furthermore, Kleiboer et al. (2006) found that receiving

emotional support from the patient was beneficial to the partner. However, in a study by Hasson-Ohayon, Golzweig, Braun, and Galinsky (2010), partners of patients with breast cancer reported receiving less social support from family and friends than did patients. This may be because friends and family believe that the patient needs more help and support than the healthy partner.

Studies examining social support in couples coping with chronic illness have largely focused on the patient as the recipient of support and the partner as the provider of support. This is problematic for a number of reasons. In intimate relationships, social support, ideally, flows back and forth between both partners (Cutrona, 1996) and there is no reason to assume that patients with a chronic illness, such as diabetes and even cancer will be unable to provide support to their partner.

2.1.2. Negative interactions between patient and partner

Unfortunately, besides having positive effects, spousal support can also have negative effects. Forms of spousal support that have been shown in studies to have negative effects on patient's self-management are well-intended support attempts, such as being overprotective or trying to buffer the patient from stress by hiding concerns and worries or protective buffering (Coyne & Smith, 1994; Kuijer et al., 2000; Schokker et al., 2010).

In addition, it is not always the case that patients and their partners interact with each other in a supportive manner. There is another side to personal relationships. It cannot be helped that there are occasions when patients and their partners engage in negative interactions. To complete the picture of the effects of spousal interactions, specifically among patients and their partners, researchers understand the need to examine not only supportive but negative interactions as well. Negative interactions can come in different forms, examples

of which are criticizing, being overly demanding, or nagging (Kleiboer et al., 2007; Manne & Zautra, 1989). It is important to investigate the influence of negative interactions on the well-being of both patients and their partners because research has shown that negative interactions may have a stronger influence on mental health than do positive interactions (Manne & Zautra, 1989; Rook, 1984).

Negative interactions have been shown to influence the way an individual adjusts to different challenges in life (Manne & Zautra, 1989). For example, a number of studies have shown that negative interactions (in different forms) are detrimental to the psychological well-being of patients and their partners. Manne and Zautra (1989) found that the more husbands made critical comments, the more the wife with rheumatoid arthritis engaged in wishful thinking and the more limited were the activities of the patients. Wishful thinking, a means of coping with an illness where the patient attempts to escape from the current stressful situation, in turn was related to poorer psychological adjustment. Furthermore, it has been shown that husband's critical remarks were related to the patient's psychological adjustment, in the same way that the patient's perception of her husband's support was related to her psychological adjustment as reflected in the coping strategies she engaged in. In another study by Manne, Ostroff, Winkel, Grana, and Fox (2005), a strong correlation was found between the breast cancer patients' rating of their partners' behaviour and of the partners' rating of their unsupportive behaviour. It was also found that it was the patients' perception of their partners' behaviour that was related to the patients' distress level. For the unsupportive behaviour to have a negative consequence on the patients' psychological distress, the patients needed to perceive the behaviour as an unsupportive one. From the results of Norton and Manne's (2007) study, it was shown that there was a higher agreement in patients' and partners' report of unsupportive than supportive behaviours.

Newsom, Mahan, Rook, and Krause (2008) examined the effects of negative interactions among older adults within a two-year period. Participants were asked about the negative exchanges, namely unsolicited advice, non-provision of help, and insensitivity, that they had with their partner, family member, friends, and others. Negative exchanges seemed to be stable rather than fleeting. Participants who reported experiencing more negative social exchanges also reported lower levels of physical health and having more difficulty in performing daily tasks.

2.1.3. Patient and partner interactions in the context of diabetes

The preceding sections (Section 2.1.1 and Section 2.1.2) discuss supportive and negative interactions, respectively, among romantic partners; this section discusses spousal support in the context of diabetes. The special role played by family members of a patient with diabetes, for example, was shown in a study conducted by Karlsen, Idsoe, Hanestad, Murberg, & Bru (2004). They examined the relationship among perceived support from health practitioners and family members, diabetes-related coping and psychological well-being among patients with type 1 or type 2 diabetes. They found that family exerted more influence on the patients' coping than health practitioners did. Furthermore, patients who perceived more family support engaged in less self-blaming, instead they were more proactive in managing their illness and in seeking ways on how to deal with their diabetes-related problems. For most patients, however, the partner specifically, being the closest person to the patient, is the most available source of support (Kiecolt-Glaser et al., 1996).

Specifically for diabetes patients and their partners, studies looking at the relation between social support, diabetes management, and patient well-being suggest that more family support and less conflict and over-involvement by the partner are associated with

better treatment adherence, illness adaptation, and better glycaemic control (e.g., Hagedoorn, Keers, Links, Bouma, Ter, Maaten, & Sanderman, 2006). With regard to adherence, it was found that support from the partner was an important factor in determining good adherence to dietary recommendation and exercise regimen. Beverly, Miller, and Wray (2008) found that type 2 diabetes patients who experienced greater assurance from their partner were better at dietary adherence. Furthermore, it was suggested that open communication between diabetes patients and their partner, and flexibility of both are two important factors that determine the couple's adjustment to dietary changes (Miller & Brown, 2005). In addition, Stephens et al. (2013) found that patients who were given more support by their partners were also the ones more adherent to the dietary recommendations of their doctors. The authors suggest that support from the partners strengthens the patients' confidence to effectively manage their diet. However, other types of interactions, aimed at helping the patient follow a healthy diet, such as persuasion decreased adherence. In a qualitative study, Beverly and Wray (2010) found that a couple's (diabetes patient and partner) confidence in the importance of working together helped in successfully adhering to an exercise regimen. This was supported by Khan et al. (2013) who found that spousal support given to type 2 diabetes patients was related to more minutes spent by patients doing moderate-to-vigorous physical activities. In addition, Van Dam et al. (2005) in a review of intervention studies found that obese female patients with diabetes lost more weight when their partner participated with them in an education program for weight loss.

Also, it was shown in a prospective study by Trief, Wade, Britton, and Weinstock (2002) that patient marital satisfaction was associated with diabetes-specific quality of life and distress two years later. Moreover, Schokker et al. (2010) found that when diabetes patients knew that the spouse was sincerely interested to know how the patient was doing

(i.e., active engagement), these patients had higher levels of relationship satisfaction. This study also examined the impact of patient support on partner outcomes and found that active engagement was also related to higher relationship satisfaction in partners.

2.2.Attachment

The overarching aim of this thesis is to examine the underlying mechanisms that determine the quality of social support interactions between patients and their partners coping with type 2 diabetes in the relationship. The current study uses attachment theory (Bowlby, 1988) as a theoretical background to study the underlying processes. In this thesis I am looking at the relationship between social support, support seeking behaviour, health outcomes, and attachment. In addition, I am also looking at the role of social support as a mediating variable in the relationship between attachment and health outcomes. Social support has been shown in the literature to be related to working models of attachment. In the next section, I will be discussing attachment theory and its relationship between supportive interactions and health outcomes.

2.2.1. Attachment theory

Bowlby, who developed attachment theory, explained that human beings are innately predisposed to forming strong and lasting emotional bonds with certain people, usually with their caregivers—those who offer nurturance, comfort, affirmation and protection.
The attachment system is a set of processes through which children's safety and survival, at the minimum, are ensured by means of their interaction with adults who are able and willing to provide care and protection (Bowlby, 1969). Based on the quality of these interactions and the relationships formed through them, cognitive representations of the self, of others, and

what might happen in the relationships between the self and others, are formed (Rholes & Simpson, 2004,). These representations are known as "working models of attachment". Working models of attachment are of great interest to researchers for they guide how people think, feel, and behave in their relationships (Rholes & Simpson, 2004). As an example, Collins (1996) found differences in how participants with different working models of attachment perceived and gave meaning to the things happening around them, the likelihood they would experience emotional distress or not, and the way they behaved in the context of a romantic relationship. Researchers refer to the set of behaviours driven by working models of attachment as the "attachment style" (Collins, Guichard, Ford, & Feeney, 2004; Rholes & Simpson, 2004). Attachment style is defined as "global individual differences in (1) tendencies to seek and experience comfort and emotional support from persons with whom one has an attachment bond and (2) presumptions about the responsiveness of attachment figures to bids for comfort and support" (Rholes & Simpson, 2004, p.4).

2.2.2. Attachment through the lifespan

Although Bowlby (and his colleague Ainsworth), did studies mostly involving children, Bowlby emphasized that attachment behaviour is not unique to children (Bowlby, 1988). He argued that the basic functions of the attachment system continue to operate across the life span, and are activated when people encounter demanding and threatening situations. During times of distress, adults, like children, exhibit behaviours sending the message they are in need of care, support, and protection. However, different aspects of support seeking such as: the way they seek, how much they seek; their response to, and the effectiveness of the support in alleviating their distress; may depend, at least in part, on the support-seeker's and support-giver's attachment style. Bowlby (1988) also believed that in adult relationships,

attachment styles impact on caregiving behaviours; adults' attachment style affects their response—their sensitivity and the amount of support they would provide—to their partners' call for help.

Researchers like Cassidy (2000) acknowledge that childhood attachment experiences have significant influence on adult attachment. In the context of a romantic relationship, the history of how earlier caregivers attended to attachment signals sent by the individual, remains influential in the way the individual seeks and responds to comfort from his or her partner (Cassidy, 2000). Cassidy warned, though, that because of individual differences, childhood attachment experiences may exert greater influence on some people than on others.

2.2.3. Attachment dimensions

Adult attachment researchers typically define four attachment styles: "secure", "preoccupied", "fearful", and "dismissing" (Bartholomew & Horowitz, 1991). These categories are based on the person's internal working models of the self and of others. The secure category includes individuals who value themselves and others. Secure individuals think of themselves as valuable and worthy of other's affection. Because secure individuals trust the sincerity of their partner and see their partner as accepting and loving, they are not afraid of being physically and emotionally intimate (Campbell, Simpson, Boldry, & Kashy, 2005; Mikulincer & Shaver, 2005). People who belong to the preoccupied category are those who value others, but do not give the same worth to themselves. As a result, they want to be intimate with others, but believe they do not deserve another's affection; thus they do not achieve as much intimacy as they want to. The dismissing category includes people who have high regard for themselves, but not for others. They would rather depend on themselves than

on other people; thus, they keep away from extending and receiving physical closeness and emotional intimacy (Bartholomew & Horowitz, 1991).

More recently, attachment researchers have focused on the underlying dimensions of attachment— anxiety (also called ambivalence) and avoidance— treating them as continuous variables, rather than focusing on four distinct categories (Collins & Feeney, 2000; Griffin & Barthholomew, 1994; Simpson, Rholes, Campbell, Tran, & Wilson, 2003). The avoidance dimension measures the degree to which "individuals desire limited intimacy and prefer to remain psychologically and emotionally independent" (Simpson, Rholes, Oriña, & Grich, 2002, p.599). The anxiety dimension measures the degree to which "people worry that relationship partners might not be available or could abandon them" (Simpson et al., 2002, p.599). Low avoidance and high anxiety correspond to preoccupied category; while high avoidance and low anxiety correspond to dismissing category. Low scores on both dimensions correspond to the secure category; while high scores on both dimensions correspond to the fearful category (Collins, Ford, Guichard, & Feeney, 2006; Rholes & Simpson, 2004).

2.2.4. Attachment and supportive interactions

With respect to the amount of social support people report receiving, research generally shows that more securely attached individuals report receiving more support than do insecurely attached individuals. For example, in a transition to parenthood study, Simpson et al. (2003) found that more ambivalent (high on anxiety and low on avoidance) or more avoidant (high on avoidance and low on anxiety) women perceived less support and greater spousal anger than did more securely attached (low anxiety and low avoidance) women. Interestingly, however, the husbands of these women reported providing as much support and

equal displays of anger as did the husbands of other women, suggesting a biased perception of insecurely attached women. Differences in perceptions of securely attached and insecurely attached participants were also found in a study done by Bachman and Bippus (2005). Securely attached individuals, compared to their insecurely attached counterparts, had a more positive evaluation of support given by friends and romantic partners. Securely attached participants believed that their partner were encouraging, empathic, and interested in and attentive to what they had to say. On the other hand, insecurely attached participants saw their partners as not being encouraging and helpful, and unconcerned with their problems.

With respect to support seeking and support giving behaviours, studies have confirmed that attachment styles are also influential on how individuals seek and give support. In general, it has been found that securely attached individuals exhibit more positive help-seeking and caregiving behaviours compared to those who are insecurely attached. For example, Simpson, Rholes, and Nelligan (1992) observed how couples behave when one of them was experiencing a demanding situation. They found that female participants who were securely attached sought more help, whereas those who were avoidantly attached (high on avoidance, low on anxiety) sought less help, as their stress level increased. As their partners experienced more stress, securely attached male participants were observed to give more support than their avoidantly attached counterparts.

In another study (Simpson et al., 2002), it was found that women who had a more secure representation of their parents, gave more support when their partners sought more support, and gave less support when partners sought less, than women who had less secure representation of their parents. Women who were regarded as more avoidantly attached to their partners gave less support, both when their partners sought more or less support, compared to less avoidantly attached women. Vogel and Wei (2005) found that anxiously

attached individuals were likely to acknowledge distress and to seek support, whereas avoidantly attached individuals were likely to deny the stress they were experiencing and to be unwilling to seek help. Collins and Feeney (2000) examined support giving and support seeking behaviours among dating couples. They found that high avoidance predicted ineffective support seeking (i.e., were less likely to seek support, and when they did they were more likely to use indirect strategies), and high anxiety predicted poor support giving (i.e., they provided less support, were less responsive and displayed more negative support giving). In another study, Feeney & Collins (2001) showed that overall attachment security was associated with more effective, responsive forms of support giving. High avoidance was related to unresponsive and controlling forms of support giving, whereas high anxiety was associated with over involvement, intrusive and controlling forms of support giving (e.g., they provided high levels of social support regardless of their partner's need for support). In a study done by Carpenter (2001), although working models of attachment did not influence the way daughters provided instrumental support to their mothers, it influenced the way they provided emotional support. More secured daughters provided more emotional support to their mothers and did not experience caregiver stress as much as the more anxious daughters.

More avoidantly attached individuals, compared with individuals of other attachment styles, were not as appreciative of, and not as comfortable and pleased with the support provided by their partner (Collins et al., 2006). This pattern was again seen in another study where participants who were more avoidantly attached regarded everyday supportive interactions with their partner less favourably as did the other participants (Campbell et al., 2005).

Davila and Kashy (2009) asked dating couples about their daily supportive interactions with each other. Participants who did not have difficulty being close to their

partner (low on avoidance) asked for more help, reported that they received and felt more support, were more sensitive to the needs of their partner and more generously responded to these needs. Those with a secure partner reported receiving more support.

Most studies examining social support interactions in intimate relationships from an attachment perspective have used healthy dating couples. I have found only two studies that used attachment theory to examine social support in couples with a chronic illness. In a cross-sectional study among male patients with type 2 diabetes, Cohen et al. (2005) found that patients scoring high on avoidance were more likely to view spousal support as less supportive. Hunter, Davis and Tunstall (2006) found that among a sample of cancer patients, both attachment anxiety and attachment avoidance were associated with lower levels of emotional support from the spouse which in turn increased the patients' negative affect.

2.2.5. Attachment and health outcomes

Although there were only a few studies which linked attachment style to spousal support in the context of illness, there are a number of studies in this area that have linked attachment to health outcomes. For example, Ciechanowski et al. (2003) found that a dismissing attachment style (high avoidance), compared to other attachment styles, was related to poorer diabetes self-care behaviours. Turan, Osar, Turan, Ilkova, and Damci (2003) found that diabetic patients with a dismissing attachment style did not adhere to regular blood tests and insulin injections. They were also found to be using negative coping strategies: avoidance and passive resignation. The research done by Ciechanowski, Hirsch, and Katon (2002) showed that patients with dismissing and fearful (high avoidance and high anxiety) styles had higher HbA1c levels (HbA1c is a marker for consistently high blood sugar levels—an indicator of poor diabetic control). Cohen et al. (2005) found that patients scoring high on

avoidance were found to have increased HbA1c levels with an increased duration of diabetes, while those scoring low on avoidance did not show this association. Research among other chronic illness populations shows that insecure attachment styles (high avoidance and/or high anxiety) may be related to higher levels of depression (Ciechanowski, Sullivan, Jensen, Romano, & Summers, 2003; see also Simpson et al., 2003), greater catastrophizing (Ciechanowski et al, 2003) and less flexible coping styles (Schmidt, Nachtigall, Wuetrich-Martone, & Strauss, 2002). Schmidt et al. (2002, p.763) suggested that being securely attached could be beneficial for patients because it can be an "inner resource" as they cope with chronic illness.

Insecurely attached patients, compared to securely attached, find it more difficult to coordinate and cooperate with their healthcare providers (Ciechanowski, Katon, Russo, & Walker, 2001; Ciechanowski et al., 2006). Participants with dismissing attachment had worse glucose control, as reflected in higher HbA1c levels, than secure or preoccupied participants (Ciechanowski et al., 2001). Furthermore, the quality of relationship between patient and healthcare provider was shown to interact with attachment style to influence glucose control. Dismissing patients who rated their communication with their healthcare provider as poor, had higher HbA1c levels than dismissing patients who rated communication with their health care provider as good (Ciechanowski et al., 2001). Being overly independent may cause problems for patients with dismissing attachment as they find it difficult to coordinate and cooperate with their healthcare providers.

Maunder and Hunter (2001), in their review, suggest three possible means through which insecure attachment is related to increased possibility of experiencing an illness: increased vulnerability to perceived stress, more use of "external regulators of affect" (which most of the time are risky behaviours), and maladaptive support seeking behaviour. Evidence

from the literature provides support to the relationship between attachment and supportive behaviours, and attachment and health outcomes. Thus, in the current study, it is worthwhile to examine the role of attachment in affecting health outcomes of patients with diabetes and of their partner, and the role of attachment in shaping the way patients and their partner interact with each other.

2.3.Illness perceptions

In addition to working models of attachment, patients' as well their partner's beliefs about the illness (i.e., illness perceptions) may influence the support processes, which in turn may have an effect on the health outcomes of both partners. In the following section, illness perceptions in the context of dealing with an illness, specifically diabetes, are discussed.

2.3.1. Common sense model of illness

The Common sense model (CSM) of illness (Leventhal et al., 1992) postulates that individuals afflicted with an illness, because of their need to comprehend and give meaning to their condition, form common-sense beliefs about the illness. These illness perceptions may be accurate or inaccurate, rather vague or detailed. Leventhal and et al. (1992) argued that it is essential to understand patients' illness beliefs as these influence the way they react to the illness (e.g., whether or not they adhere to their treatment, and which coping strategies are used). The patients' experience as a result of their illness (e.g., symptoms and their consequences in the patients' daily activities) and how they make sense of this experience may even be more important determinants of their understanding about their condition, than the patients' abstract (e.g., medical information) comprehension of the illness.

The development of the Common Sense Model (CSM) (Leventhal et al., 1992) was an attempt to incorporate different factors (e.g., internal-external motivation), suggested by other models, that explain adherence behaviour into one inclusive model. Thus, CSM includes both cognitive and affective aspects, and looks at both personal and social contexts. This schema of illness includes both cognitive and emotional components. The major cognitive components identified from research are (Leventhal et al., 1992): identity, cause, time line, consequences, and cure/control. Identity comprises of the label of the illness and the symptoms the patient views as being part of the disease. The cause dimension includes personal ideas about aetiology which may include simple single causes or more complex multiple causal models. Timeline represents the length of time or duration of the illness as perceived by the patient; the illness can be classified as being acute, chronic, or episodic. Consequences are the expected effects and outcomes of the illness. Lastly, cure or control includes views on how one recovers from the illness and how much control one has over the illness. The emotional dimension of illness perceptions includes one's feelings about how the illness has affected one's life.

There are a number of factors that help shape a patient's illness perceptions. A study done by Aalto et al. (2005) among coronary heart disease (CHD) patients examined three factors: severity of the illness, the patients' social network experiences with CHD, which the researchers called "vicarious experiences", and the patients' psychological resources, namely perceived competence and social support. It was found that patients who perceived that they could rely on others for support, perceived that they exerted more personal control over their illness, and that their illness had less consequences for them. Another source of information in forming one's illness perceptions is family. A study by Scollan-Koliopoulos, Walker, and Rapp (2011) examined the influence of having a patient with diabetes in the family on one's

illness perceptions with regard diabetes. The authors used the term "multigenerational legacy of diabetes" to refer to their observation that patients with diabetes who knew of a family member with the same illness formed their own views of diabetes based on the experiences of this family member.

2.3.2. Patient illness perceptions, health outcomes, and coping

It is important to examine patients' own representation of their illness for it influences patients' reaction to the illness (which includes coping strategies used, self-management behaviour, and support seeking behaviour).

There is considerable evidence, among patients with different illnesses, that patients' illness perceptions are related to their physical health, psychological well-being and quality of life. For example, with regard to physical health, a study done by Boot, Heijmans, van der Gulden, and Rijken (2008) showed that patients' illness perceptions were related to their ability to work full-time. There were more patients who believed their illness had more consequences, who were not able to commit to a full-time job because of disability, compared to patients who believed their illness had less effect on their lives. With regard to psychological well-being, in their longitudinal study among patients with Parkinson's disease, Evans and Norman (2009) found illness perceptions to be associated with anxiety and depression concurrently and prospectively. Patients who viewed their illness as having more consequences experienced higher levels of anxiety and depression. In addition, patients who had a more negative emotional representation of their illness experienced higher levels of depression. Furthermore, patients' score on the dimension of control predicted their levels of anxiety while patients' score on the dimension of consequences predicted levels of depression after controlling for the levels of anxiety and depression at study entry. Patients

who at study entry believed they had less control over their illness, experienced higher levels of anxiety six months after. Also, patients who at study entry perceived the consequences of their illness as being more significant experienced higher levels of depression six months after. Results of a study by Edwards, Suresh, Lynch, Clarkson, and Stanley (2001), among individuals who suffer from chronic fatigue syndrome (CFS), showed that CFS sufferers who reported more symptoms, who believed their illness brought more consequences, who perceived they had less control over their illness, and who believed that psychological factors caused CFS, reported higher levels of anxiety and depression.

Foxwell, Morley, and Frizelle (2013) conducted a review of studies looking at the relationships between illness perceptions and psychological well-being among CHD patients. They noted that CHD patients who experienced lower levels of quality of life were also the ones who perceived their symptoms as being due to CHD, who perceived experiencing more consequences of their illness, and who perceived their illness to last for a longer period of time. In addition, patients who experienced higher levels of anxiety and depression were the ones who had a minimal understanding of their illness, who perceived their illness as bringing more consequences, and who perceived themselves and the medical treatment they were undergoing as exerting less control over their illness. In another study, Broadbent, Petrie, Ellis, Ying, and Gamble (2004) measured myocardial infarction (MI) patients' beliefs about their illness by asking them to draw the damage caused by myocardial infarction to their heart. Patients who drew damage to their heart at study entry, compared to those who did not, six months after, perceived themselves as recovering less slowly and as exerting less control over their illness, and believed that their illness lasted longer. In addition, six months after, patients who perceived their heart as being damaged, took more days before returning to work and were more distressed.

The way patients view their illness also influences the strategies they use to adapt to their illness. In turn, the way they cope with the illness affects their level of adaptation to the illness. Illness perception dimensions were correlated with each other. CFS patients who reported experiencing more symptoms also believed that their illness would last longer, had more serious consequences, and that they had less control over their illness (Heijmans, 1998). Patients who believed that their illness would last longer were less likely to use problem-focused coping, to seek social support, and to vent emotions (Heijmans, 1998). Conversely, patients who believed that their illness would last longer were more likely to use cognitive-avoidant coping (Heijmans, 1998). With regard the relationship between illness perceptions and "adaptive outcomes", patients who reported stronger illness identity, perceived their illness as lasting longer, and viewed their illness as having more serious consequences also reported lower levels of physical functioning and social functioning (psychological adjustment, and subjective well-being) (Heijmans, 1998). Patients who perceived themselves as having more control over their illness were better adjusted in terms of physical functioning, psychological well-being, and energy (Heijmans, 1998). Patients who gave more weight to biological factors as the cause of the illness experienced higher level of mental health but lower level of vitality. Conversely, patients who gave more weight to psychological factors as the cause of the illness experienced lower level of mental health (Heijmans, 1998).

Hagger and Orbell (2003) conducted a meta-analytic review of 45 studies, across a varied sampling of medical conditions (e.g., acute pain, atrial fibrillation, cancer, chronic obstructive pulmonary disease, diabetes mellitus, HIV/AIDS, psoriasis, and recovery from oral surgery), examining the relationships between illness perceptions and coping techniques as used by patients and health outcomes of patients. Patients who reported more symptoms

and who believed that their illness would last for a longer period of time, also reported experiencing lower levels of psychological well-being, role functioning and vitality and higher level of psychological distress. In contrast, patients who perceived themselves as having more control over the illness reported experiencing higher levels of psychological well-being and vitality.

2.3.3. Patient illness perceptions in the context of diabetes

Illness perceptions influence diabetes patients' psychological as well as physical health. In addition, diabetes patients' illness perceptions affect the way they manage their diabetes. Paschalides et al. (2004) examined the relationship between patients' illness perceptions and their levels of anxiety and depression, and their glycaemic control. They found that patients who reported more diabetes symptoms, who viewed their illness as having more significant consequences on their life and who believed that they exerted less control over their illness were the ones who also experienced higher levels of anxiety and depression. In addition, patients who believed that their illness would last for a longer period of time also experienced higher levels of anxiety. After controlling for demographic and medical-history variables, identity and consequence scores were related to physical well-being (health-related quality of life, physical component score), and control and consequence scores were related to psychological well-being (health-related quality of life, mental component score).

Furthermore, a study by Hampson, Glasgow, and Strycker (2000) revealed that patients with diabetes who had higher levels of depression, compared to those with lower levels of depression, believed that they had less control over their illness and believed their illness was more serious. In addition, it has been found that patients who do not manage their diabetes well have significantly different views about their illness compared to those who

manage their diabetes well. Patients who were not managing their diabetes well were more likely to believe in a hereditary cause of their illness, reported more symptoms, and believed that their illness had more consequences (Keogh et al., 2007). A study by Hampson (1997) found that diabetes patients who believed that their treatment regimen was effective in dealing with their illness adhered more to their dietary regimen. Even 12 months after, patients who believed that their treatment was effective, at study entry, had lower cholesterol level. Furthermore, participants who perceived they exerted more control over their illness had better glucose control also 12 months after (Hampson et al., 2000) In another study, it was found that patients who perceived their illness as bringing more consequences, who believed they exerted more control over their illness, and who reported fewer symptoms were the ones more adherent to their medication regimen (Broadbent, Donkin, and Stroh, 2011).

A study by Paddison, Alpass, and Stephens (2010) showed that type 2 diabetes patients who found it difficult to understand their illness reported experiencing higher levels of diabetes-related distress. Furthermore, patients who reported that their symptoms were more unpredictable also experienced higher levels of diabetes-related distress.

2.3.4. Partner illness perceptions

The social context is important in studying illness perceptions. It is not only the self which is actually involved in shaping these perceptions; rather these perceptions are formed by the self in the context of a particular environment (Dempster, McCarthy, & Davies, 2011).

A salient environment is the patient's family. As noted in the section on spousal support, patients are closest to their partners. Partners need to make sense of the patient's illness for they are also affected by it. Partners also feel distress, frustration, and added pressure. Partners, therefore, form their own schema of the patient's illness, and these illness

representations may not only influence their own well-being, but also the patient's disease outcomes, potentially through the way patients and partners interact with each other (supportive and negative interactions).

Although the main focus of research into illness perceptions has been on perceptions of patients, there have been a few studies looking at perceptions of the spouse. A study by Heijmans, De Ridder, and Bensing (1999) inquired into the points of agreement and disagreement in patient's and partner's illness perceptions. Specifically, they examined how minimization and maximization of the patient's illness by the spouse relates to the way patients' coped and how well they have adapted to the illness. Minimization happens when the spouse thinks less of the seriousness of the illness, compared to what the patient thinks of it. On the other hand, maximization is present when the spouse believes that the illness has greater consequences than what the patient perceives it to have. The participants in this study were patients with CFS and Addison's disease (AD) and their partners. Compared to patients, partners of CFS patients perceived less symptoms of the illness, believed that the illness had less consequences, and that the illness could be cured. In contrast, AD partners, compared to the patients, perceived the illness as having more consequences. Thus, partners of CFS patients had the tendency to downgrade implications of the illness; whereas partners of AD patients tended to exaggerate the consequences of the illness. It should be noted, however, that the minimization and maximization by the spouses was in relation to the perceptions of the patients. Minimization by the partner was, generally, shown to be related to higher levels of impairment of patient functioning. In a different study, Figueiras and Weinman (2003) examined the congruence between MI patients' and their partners' illness perceptions. This study sought to investigate how similar (or dissimilar) the MI patients' and their partners' views were about the illness. Furthermore, it looked into the relationship between similarity

of illness perceptions and patients' recovery outcomes (physical disability, psychological adjustment, vitality, health distress, and sexual functioning), social and recreational activities, and health behavior (diet) change. As hypothesized, patients of couples who had similar positive perceptions were recovering better. On the contrary, patients of couples who had similar negative perceptions, scored lower on recovery outcomes; even lower than couples who were incongruent in their perceptions.

2.3.5. Illness perceptions and social support

To the best of my knowledge is the study conducted by Benyamini, Medalion, and Garfinkel (2007) is the only study to date examining the role of illness perceptions in social support. In their study, they found no significant difference between the illness perceptions of patients and their partners. However, there was a difference in the perception of patients on how much support they received as a function of their illness perceptions. Patients who had a more positive attitude towards their illness, those who thought that their illness would last only for a shorter period of time and those who believed that they exerted more control over their illness, reported receiving more spousal support. Moreover, more negative illness perceptions—view that the illness had more symptoms and led to more consequences—were associated with more support provided by partners. There was agreement between patients and partners when it came to perceiving more symptoms and provision of negative interactions. Patients who reported "stronger identity" also reported receiving more negative interactions, while partners who reported "stronger identity" reported providing more negative interactions. Likewise, partners who believed that their spouse's illness was caused by "lifestyle" factors and "stress" reported that they provided more negative interactions to the patients (Benyamini et al., 2007).

The more divergent the partners' illness perceptions were from the patients', with the partners' illness perceptions being more negative, the more support the partners reported providing. In addition, the more divergent were the partners' and the patients' illness perceptions, with the patients' illness perceptions being more positive, the more support the patients reported receiving. Furthermore, partners who believed that the illness was caused by lifestyle factors, "more than the patient did", reported giving more spousal support, but at the same time more negative interactions.

2.4.Summary

In New Zealand, as well as in other parts of the world, a growing number of individuals are diagnosed with type 2 diabetes (American Diabetes Association, 2013; Ministry of Health, 2012). Management of type 2 diabetes depends almost entirely on behavioural self-regulation. Patients must perform a number of daily self-management tasks (e.g., following medical recommendations for diet, exercise, and medication, checking blood glucose levels) to control their diabetes (e.g., Ciechanowski et al., 2005; Gonder-Frederick et al., 2002). Adequate self-management is important because poorly controlled type 2 diabetes is associated with serious long-term health consequences. Making these tasks part of daily routine can be challenging for patients.

Ample research has shown that individuals with diabetes experience more problems involving their psychological well-being compared to individuals without diabetes (e.g., Aguilar-Zavala et al., 2008; Cohen & Kanter, 2004; Engum et al., 2005; Fisher, 2006). There is also evidence to suggest that patients with diabetes who have lower levels of psychological well-being are having more difficulty in managing their illness (Egede et al., 2002; Fisher, 2006; McKellar et al., 2004). In order to perform required self-management

tasks and maintain their psychological well-being, patients may need support and help from their partner. Many studies have described the beneficial effects of spousal supportive behaviours on well-being in general, as well as on adjustment to chronic illness (e.g., Cutrona, 1996). Although different researchers distinguish between different types of support, most authors distinguish between emotional support and instrumental support. Both types of support may be important for patients with diabetes and will thus be examined in the current study. Unfortunately, besides being supportive, interactions with the partner can also be negative (e.g., being overly demanding, critical, nagging) (c.f. Kleiboer et al., 2006). Studies looking the relation between social support, diabetes management and patient well-being suggest that more family support and less conflict and over-involvement by the partner is associated with better treatment adherence, illness adaptation, and glycaemic control (Beverly et al., 2008; Hagedoorn et al., 2006; Miller & Brown, 2005; Stephens et al., 2013). The way in which support is sought may also have an effect on outcomes, with more direct ways of seeking support being more effective (i.e., related to better health outcomes) than indirect ways (e.g., hinting that one has a problem without asking for help or support) of seeking support (Collins and Feeney, 2000).

Studies examining social support in couples coping with chronic illness have largely focused on the patient as the support receiver and the partner as the support provider. This is problematic for a number of reasons. In intimate relationships social support (ideally) flows back and forth between both partners (Cutrona, 1996) and there is no reason to assume that patients with a chronic illness such as diabetes would be unable to provide support to their partner. Moreover, coping with chronic illness can be seen as a "dyadic affair" (Coyne & Smith, 1994): the chronic illness affects the lives of both patients and partners, hence partners

need support too. Indeed, research has shown that receiving support from one's ill partner has beneficial effects for the health partner (Kleiboer et al., 2006).

Although important, the underlying mechanisms that determine the quality of social support behaviours among intimate partners are not fully understood (Feeney & Collins, 2003). The current study used attachment theory (Bowlby, 1988) and the common sense model of illness (Leventhal et al., 1992) as theoretical backgrounds to study the underlying processes.

The main idea behind Bowlby's attachment theory is that human beings have a built-in system which enables them to make sure they are in proximity to another human being who can help them adapt to, and even survive amidst harsh changes in the environment (Bowlby, 1969) As a children interact with their caregivers, they form cognitive representations, based on the quality of these interactions, of the self (as worthy or unworthy love) and of others (as responsive or unresponsive and as available or unavailable), known as working models of attachment, are developed (Rholes & Simpson, 2004). Although most attachment studies done by Bowlby and his colleague (Ainsworth) involved children, attachment behaviour is not unique to children. Bowlby (1988) argued that the basic functions of the attachment system continue to operate across the life span and are activated when people encounter demanding and threatening situations. In more recent studies, researchers studying attachment have focused on two underlying dimensions of attachment—anxiety and avoidance (Collins & Feeney, 2000; Griffin & Barthholomew, 1994; Simpson, Rholes, Campbell, Tran, & Wilson, 2003). Attachment theory has guided studies looking at support seeking (Collins & Feeney, 2000; Davila & Kashy, 2009; Vogel & Wei, 2005), support giving (Carpenter, 2001; Collins & Feeney, 2000; Davila & Kashy, 2009; Feeney & Collins, 2001; Simpson et al., 2002), and perceptions regarding support received (Bachman &

Bippus, 2005; Cohen et al., 2005; Collins, et al., 2006; Davila & Kashy, 2009; Hunter et al., 2006; Simpson et al., 2003). Participants who were more secure were observed to seek more help when distressed (Collins & Feeney, 2000; Davila & Kashy, 2009), to provide more support (Carpenter, 2001; Collins & Feeney, 2000; Davila & Kashy, 2009; Feeney & Collins, 2001; Simpson et al., 2002), and to have a more positive view of the support they received (Bachman & Bippus, 2005; Cohen et al., 2005; Collins, et al., 2006; Davila & Kashy, 2009; Hunter et al., 2006; Simpson et al., 2003). A number of studies have also found a link between attachment and health outcomes. Patients with diabetes who scored higher on avoidance were observed to have poor diabetes self-care behaviours (Ciechanowski et al., 2003), to have low adherence to blood tests and insulin injections (Turan et al., 2003), to be using negative coping strategies (Turan et al., 2003), to have higher blood glucose level (Ciechanowski et al., 2002; Ciechanowski et al., 2001; Cohen, 2005), and to have an increased duration of diabetes (Cohen, 2005). Furthermore, patients with diabetes who scored higher on anxiety were also observed to have higher blood glucose level (Ciechanowski et al., 2002). Aside from these findings, patients with diabetes who scored higher on avoidance or those who scored higher on anxiety were observed to have higher levels of depression (Ciechanowski et al., 2003), to be involved in greater catastrophizing (Ciechanowski et al., 2003), to have poor coping styles (Schmidt et al., 2002), and to have more difficulty in cooperating with healthcare providers (Ciechanowski et al., 2001; Ciechanowski et al., 2006).

Another variable that has been found to be an important determinant of health outcomes in diabetes patients is illness perceptions as suggested by the common sense model of Leventhal et al. (1992). The main idea behind the common sense model (CSM) of illness (Leventhal et al., 1992) is that individuals experiencing a particular illness form their own perceptions of the illness, which include both cognitive and affective aspects. More than the

medical information, individuals with an illness use their personal experience of the illness to form such perceptions. These perceptions influence the way an individual responds to the illness, specifically adherence, thus it is important to carefully examine these perceptions to have a better understanding of patient behaviour.

Research has shown that there is a relationship between the illness perceptions of patients and their physical health (Boot et al., 2008; Paschalides, 2004) and psychological well-being (Broadbent et al., 2004; Evans & Norman, 2009; Foxwell et al., 2013; Hagger & Orbell, 2003). For example, patients who scored higher on consequence perception reported more physical limitations (Boot et al., 2008). Furthermore, other studies have found that patients who scored higher on emotional representation (Evans & Norman, 2009), consequence perception (Edwards et al., 2001; Evans & Norman, 2009), and identity (Edwards et al., 2001), but scored lower on illness coherence perception (Foxwell et al., 2013), control perception (Edwards et al., 2001; Foxwell et al., 2013; Hampson et al, 2000), and believed that psychological factors caused their illness (Edwards et al., 2001) reported experiencing higher levels of anxiety and depression.

Illness perceptions of patients with diabetes have also been shown to be related to their physical health and psychological well-being. For example, patients who scored higher on identity and consequence perceptions reported lower levels of physical functioning (Paschalides, 2004). In addition, patients who scored lower on control perception reported experiencing higher levels of depression.

Aside from illness perceptions of patients with diabetes, it has also been shown that illness perceptions of partners are related to health outcomes of patients (Heijmans et al., 1999).For example, in a study done by Figueiras and Weinman (2003), patients who were in agreement with their spouses on positive illness perceptions were observed to recover better.

Furthermore, it has also been shown that illness perceptions of both patients and partners have a role in the social support and negative interactions that they reported receiving and providing, respectively (Benyamini et al., 2007). For example, Benyamini et al. (2007) found that patients who perceived more symptoms reported receiving more negative interactions from the partners; while partners who perceived more symptoms reported providing the patients more negative interactions.

The following chapter discusses the goals, framework, hypotheses, and significance of the current study.

3. THE PRESENT STUDY

3.1.Goals

The goal of the present study is to bridge some important gaps in the literature concerning the relationship between different predictor variables, specifically working models of attachment and illness perceptions, and health outcomes in patients with type 2 diabetes and their partner. Furthermore, it is the objective of the study to examine the mediating role that support seeking and supportive and negative interactions play in the relationship between attachment and health outcomes as well as between illness perceptions and health outcomes. The study addresses some areas of research where answers are still wanting.

3.2.Framework

From the literature it has been shown that dealing with the medical and psychological outcomes of type 2 diabetes while trying to effectively manage it presents a burdensome task to the patients. Results from studies seem to point to the bidirectional relationship between patients' behaviour needed to avert diabetes' more serious medical complications. It has become apparent then that aside from making sure that blood glucose level stays as close to normal as possible, it is also to the patients' advantage that they are experiencing a high level of well-being (both general psychological and diabetes-specific). Both patient and partner are experiencing dyadic coping as they deal with the illness. This means that partners are also affected by the illness, thus they need to adapt and are actually going through different stages of adjustment to the illness. As a consequence, partner psychological distress and physical

health are also influenced by the challenges facing the patient. Furthermore, couples facing a chronic illness engage in both supportive and negative interactions with each other. Supportive interactions include seeking-support and receiving support. Negative interactions may come in the form of demanding too much, criticizing, and underestimating the illness. Both supportive and negative interactions influence health outcomes (physical health and psychological well-being) of patients and partners.

The value of research on the influence of social support on diabetes management is hard to overestimate. The literature suggests that spousal support and the whole process of receiving and providing support, is of prime importance for the adjustment and over-all well-being not only for the patients but for their partner as well; but the spotlight has always been on the patients receiving and the partner providing support. Very little is known about how patients and partners experience seeking and receiving support at the same time.

The theory of attachment is a good theoretical framework to use in closely examining the effects of spousal interaction—supportive and negative—on health outcomes. First the theory of attachment focuses on dyadic relationship—between an individual and an attachment figure. In the current study, the partner is the patient's attachment figure. Second, in attachment theory the attachment system is closely related to the caregiving system and to support-seeking processes. For example, in their study, Collins and Feeney (2000) found that individuals who scored higher in avoidance engaged in more indirect support seeking strategies, compared to those lower in avoidance. Furthermore, literature reveals that individuals who were more securely-attached, compared to insecurely-attached engage in more effective support seeking and support giving behaviour.

It has been shown that attachment styles (which are driven by working models of attachment) influence the support seeking behaviour of romantic partners during highly

stressful situations, yet very few studies have examined how working models of attachment influence the give and take of support in times of chronic illness. Third, one of the implications of attachment theory, as shown in the literature, is that attachment is related to physical and psychological well-being. However, the possibility that support seeking and receipt of support might mediate this relationship was not yet explored.

In the current study, I looked at the underlying dimensions of attachment: anxiety and avoidance (see Section 2.2.3) in accordance with what is being used in studies in the intimate relationships literature (e.g., Simpson et al., 2003).

The second theoretical framework used in this thesis is the common sense model of illness (Leventhal et al., 1992). Agreement in illness perceptions between spouses is related to better functioning among patients, but the possible role of supportive and negative interactions in this relationship was not considered.

The current study is a longitudinal study that examined the influence of two predictor variables: working models of attachment to romantic partners and illness perceptions, on health outcomes in couples dealing with type 2 diabetes. Health outcomes for the patients and partners were: psychological distress and physical health; and for patients only: diabetes well-being. It also examined the important mediating role of the support seeking, receipt of support, and negative interactions in these relationships: attachment styles and health outcomes, and illness perceptions and health outcomes.

3.3.Hypotheses

For the present study it was hypothesized that:

Hypothesis 1: Attachment variables should be related to support seeking behaviour. Patients and partners who score higher on attachment variables (i.e., higher on anxiety or higher on avoidance) will engage in more covert support seeking behaviour and less overt support seeking behaviour (Hypothesis 1a). Furthermore, spousal effects were expected: spouses of participants who score higher on attachment variables will engage in more covert and less overt support seeking behaviour (Hypothesis 1b).

Hypothesis 2: Attachment variables should be related to supportive and negative interactions. Patients and partners who score higher on attachment variables (i.e., higher on anxiety or avoidance) will report receiving less emotional, and instrumental support, and more negative interactions from their spouse. Furthermore, patients and partners who score higher on attachment variables will also be less satisfied with the support they receive (Hypothesis 2a). Similarly, spouses of participants who score higher on attachment variables will report receiving less emotional support, less instrumental support, and more negative interactions (Hypothesis 2b).

Over time, associations between attachment variables and changes in participants' reports of supportive interactions (emotional support and instrumental support), negative interactions, and satisfaction with support will be explored.

Hypothesis 3: Attachment variables should be related to health outcomes. Participants who score higher on attachment variables (i.e., higher on anxiety or higher on avoidance) will experience lower levels of physical health, higher levels of psychological distress, and lower levels of diabetes well-being (patient only) (Hypothesis 3a). Spouses of participants who

score higher on attachment variables will experience lower levels of physical health, higher levels of psychological distress, and lower levels of diabetes well-being (patients only) (Hypothesis 3b).

Over time, associations between attachment variables and changes in participants' physical and emotional well-being will be explored.

Hypothesis 4: Support seeking behaviour and supportive and negative interactions should be related to health outcomes. Patients and partners who engage in more covert support seeking and less overt support seeking will experience higher levels of psychological distress, lower levels of physical health, and lower levels of diabetes well-being (patients only) (Hypothesis 4a). Furthermore, patients and partners who report receiving more supportive interactions (emotional and instrumental support), fewer negative interactions, and who are more satisfied with the support they receive, will experience lower levels of psychological distress, higher levels of physical health, and higher levels of diabetes well-being (patients only) (Hypothesis 4b).

Over time, associations between support seeking and supportive and negative interactions, and changes in participants' physical and emotional well-being will be explored.

Hypothesis 5: Support seeking behaviour and supportive and negative interactions should mediate the relationship between attachment variables and health outcomes.

Hypothesis 6: Illness perception variables should be related to support seeking behaviour. Patients and partners who score higher on timeline t cyclical, on illness coherence perceptions, on personal control, and on treatment control perceptions will report engaging in more overt and less covert support seeking behaviour (Hypothesis 6a). Furthermore, spousal effects were expected: spouses of participants who score higher on timeline time cycle, on

illness coherence, on personal control, and on treatment control perceptions will report engaging in more overt and less covert support seeking behaviour (Hypothesis 6b).

Hypothesis 7: Illness perception variables should be related to supportive and negative interactions. Patients and partners who score higher on personal control, treatment control, and illness coherence will report receiving more emotional, and instrumental support, and less negative interactions. In addition these patients and partners will be more satisfied with the support they receive (Hypothesis 7a). Also, spouse of participants who score high on personal control, treatment control, and illness coherence will report receiving more emotional and instrumental support, and less negative interactions Furthermore, they will report being more satisfied with the support they receive (Hypothesis 7b).

Hypothesis 8: Illness perception variables should be related to health outcomes. Specifically, personal control, treatment control, and illness coherence should be positively associated with physical health and diabetes well-being and negatively associated with psychological distress. Patients and partners who score lower on personal control, on treatment control, and on illness coherence will experience lower levels of physical health, and higher levels of psychological distress . Patients who score lower on personal control, on treatment control, and on illness coherence will experience lower levels of diabetes well-being (Hypothesis 8.a). Furthermore, spouse of participants who score lower on personal control, on treatment control, and on illness coherence will report experiencing lower levels of physical health and higher levels of psychological distress. Patients who have a partner who score lower on personal control, treatment control, and illness coherence will report experiencing lower levels of diabetes well-being (Hypothesis 8.b).

Overt time, associations between illness perception variables and changes in participants' physical and emotional well-being will be explored.

Hypothesis 9: Support seeking behaviour and supportive and negative interactions will mediate the relationship between illness perceptions and health outcomes.

3.4.Significance of the study

It is hoped that through this study, we will gain a better understanding of the mechanisms involved in two-way spousal support experienced by couples battling with diabetes. Specifically, we will obtain a better understanding of what important factors determine effective and ineffective support seeking and caregiving behaviours with accompanying recommendation as to how to make them better. The results of this research can also be used by health practitioners to help couples cope with diabetes better. It is also hoped that this study could open doors to future research of the same type but which looks at other kinds of chronic illness.

4. METHOD

4.1.Participants

Participants were 70 couples from New Zealand. One member of each couple was diagnosed with type 2 diabetes. Most patients were male (63%), they ranged in age from 25 to 82 years (mean age 57 years) and most were of New Zealand European descent (79%). Most patients either had full-time (30%) or part-time jobs (19%) or were retired (24%). The partners were about the same age (mean age 55; range 24-80), were also predominantly of New Zealand European descent (84%), and most partners were also either employed full-time (37%) or part-time (20%) or were retired (27 %). (See Table 4.1 for a summary of participant demographics).

The majority of participants were married couples (87%). The remaining couples were either in a de facto relationship (11%) or had a civil union (1 couple). The couples had been in the current relationship for an average of 27 years and most couples had one or more children. The median annual income for couples in the current study was between NZD 21,000-40,000. Although the percentage of participants of New Zealand European descent was high in the current sample, this is in line with census figures for this region. According to Statistics New Zealand (2013), 77.4 per cent of the Canterbury Region residents come from the European ethnic group; whereas 7.2 per cent belong to the Maori ethnic group. Furthermore, the recent annual income for New Zealanders in 2012 was around NZD 42,000 (Statistics New Zealand, 2013).

The mean number of years that the patients had been diagnosed with type 2 diabetes was 7 years and they had experienced different symptoms since the diagnosis. Some of these symptoms were: fatigue, changes in vision, high blood pressure, excessive thirst, excessive excretion of urine, and constant hunger. Patients also reported having other diabetes-related medical conditions such as: diabetic eye problems, nerve damage, skin infection, mouth infection, nephropathy, foot ulcer, heart disease, thyroid problems, and other conditions (see Table 4.2).

Table 4.1: Participant Demographics

		Patients		Partners	
		M or %	*SD* or *n*	*M* or %	*SD* or *n*
Age		57.0	1.48	55.13	1.56
Sex[1]					
	Male	62.9%	44	34.3%	24
	Female	37.1%	26	65.7%	46
Ethnicity					
	New Zealand European	78.6%	55	84.3%	59
	New Zealand Maori	2.9%	2	2.9%	2
	Samoan	1.4%	1	1.4%	1
	Asian	4.3%	3	2.9%	2
	Other	10.0%	7	8.6%	6
Birth Country					
	New Zealand	68.6%	48	80.0%	56
	United Kingdom	17.1%	12	11.4%	8
	Australia	2.9%	2	0.0%	0
	The Philippines	4.3%	3	1.4%	1
	Other	7.1%	5	7.1%	5
Employment					
	Full-time job	30%	21	37.1%	26
	Part-time job	18.6%	13	20%	14
	Full-time homemaker	10%	7	8.6%	6
	Receives a disability benefit	10%	7	5.7%	4
	Retired	24.3%	17	27.1%	19
	Enrolled as apart-time student	2.9%	2	0%	0
	Other	4.3%	3	1.4%	1
Highest school qualification					
	Left without school certificate	25.7%	18	31.4%	22
	NZ school certificate	14.3%	10	8.6%	6
	NZ sixth form certificate	4.3%	3	1.4%	1
	NZ higher school certificate	5.7%	4	1.4%	1
	Other secondary school qualification	8.6%	6	5.7%	4
	Trade certificate	5.7%	4	17.1%	12
	Other polytechnic certificate or diploma	10%	7	12.9%	9
	University degree	14.3%	10	7.1%	5
	University postgraduate qualification	8.6%	6	8.6%	6
Relationship duration[2]		27.40	1.83		
Relationship status[2]					
	Married	87.1%	61		
	De facto	11.4%	8		
	Civil union	1.4%	1		
Annual Income[2]					
	0-20,000	12.9%	9		
	21,000-40,000	35.7%	25		
	41,000-60,000	12.9%	9		
	61,000-80,000	8.6%	6		
	81,000-100,000	12.9%	9		
	101,000+	8.6%	6		

Note: Percentages do not add up to 100% for some variables due to incidental missing values.
[1]The sample consisted of 69 male-female couples and one female-female couple.
[2]Relationship variables presented only once as values are identical for patients and partners.

Table 4.2: Patients' Medical History

Medical History	*M* or %	*SD* or *n*
Years since diagnosis	7.19	6.18
Symptoms		
Changes in vision	47.1	33
Constant hunger	20.0%	14
Excessive urine	32.9%	23
Excessive thirst	28.6%	20
Fatigue	62.9%	44
High blood pressure	37.1%	26
Weight loss	22.9%	16
Other	8.6%	6
With other diabetes-related medical conditions		
Diabetic nephropathy	5.7%	4
Eye problem	10.0%	7
Foot ulcers	1.4%	1
Heart disease	17.1%	12
Mouth infections	5.7%	4
Nerve damage	11.4%	8
Skin infection	8.6%	6
Thyroid problems	4.3%	3
Other		

Note: $N = 70$ couples.

4.2.Procedure

Patients with type 2 diabetes and their partners were recruited to participate in the present study. They were invited through posters and brochures distributed to a number of health practitioners' clinics (general practitioners, podiatrists, and physiotherapists), hospitals, medical laboratories, malls, and libraries. Public notices were also placed in the New Zealand diabetes society magazine and websites, community papers, and free broadsheet paper. Couples who responded by contacting the researcher were sent an information sheet (Appendix B); a week later they were asked if they agreed to become study participants.

Participants (patients and partners) who agreed to participate in the study completed questionnaires twice--upon study entrance (Time 1) and six months later (Time 4). In each instance, the questionnaires were posted to the couples. They were instructed not to discuss the questions and to answer the questions independently of each other. The patients and their partners sent back the questionnaires in separate envelopes. In between these times, they were contacted twice and were asked some questionnaire items by phone (Time 2 and Time 3 were two months and four months after study entrance, respectively); however, the data for Time 2 and Time 3 were not used for the current thesis. Each couple received a gift card upon completion of Time 1 questionnaires and another one upon completion of Time 4 questionnaires. Refer to Table 4.4 for a summary of measures used and the time points they were completed. This study was approved by the University of Canterbury Human Ethics Committee (HEC 2007) see Appendix A for documentation.

For couples to be included into the study, they had to meet the following criteria: (a) one member was diagnosed with type 2 diabetes at least one year prior to the study, (b) they were in a stable romantic relationship during the time of the study, (c) both members were

residing in New Zealand, (d) both spoke fluent English, and (d) both were willing to participate in the present study. Out of a total of 95 couples who expressed interest in the study, ten couples decided not to take part after being given the information sheet and six couples did not meet the inclusion criteria. Reasons for not taking part included : being too busy with other commitments, the concern that participation in this study would mean "opening up old wounds", and that after reading what was involved in the study they decided to decline to participate. Reasons for not meeting the inclusion criteria were: both members of the couple having type 2 diabetes, the couple (who responded through a website advertisement) not being in New Zealand, the partner being not fluent in English, the patient having type 1 instead of type 2 diabetes, and the patient being diagnosed for less than 1 year . The couples who consented to take part in the study ($N = 79$) were sent the first set of questionnaires Seventy couples returned the first completed questionnaires, while nine couples did not (after having received up to two reminders). The 70 couples who returned the first questionnaires were the participants for the cross-sectional part of the current study and were asked to complete the other three questionnaires. Of these 70 couples, 62 couples completed the final (Time 4) questionnaire (89% retention rate). The data collection for the current study was completed before the Canterbury earthquakes struck the region.

4.3.Measures

Because of copyright restrictions, the scales (and therefore the complete questionnaires) used throughout this thesis cannot be reproduced in their entirety (with the exceptions of the social support scales which were adapted from existing scales – they are included as Appendices C and D). Sample items from each scale are given as examples.

4.3.1. Working models of attachment (Time 1)

To assess working models of attachment, participants (patients and partners) completed The Adult Attachment Questionnaire (AAQ) (Simpson, Rholes, & Phillips, 1996). The AAQ, which consists of 17 items, measures the dimensions of avoidance and anxiety. Avoidance refers to the degree to which an individual avoids psychological and emotional dependence (Simpson et al., 2002). Anxiety refers to the extent of the individual's concern that a partner will not be there by his or her side in times of need or that he or she would be left by the partner (Simpson et al., 2002). Both avoidance and anxiety dimensions of the AAQ were shown to be valid (Simpson et al., 2003) and internally consistent in previous research (Campbell et al., 2005; Simpson et al., 2002; Simpson et al., 1996).

Examples of AAQ items are: "I find it relatively easy to get close to others" (avoidance), and "I often worry that my partner(s) don't really love me" (anxiety). Participants rated each item on a scale from 1 (strongly disagree) to 7 (strongly agree). The avoidance subscale consisted of eight items ($\alpha = .84$ for patients and $\alpha = .81$ for partners) and the anxiety subscale consisted of 9 items ($\alpha = .63$ for patients and $\alpha = .62$ for partners).

4.3.2. Illness perceptions (Time 1)

Patients answered the Revised Illness Perception Questionnaire (IPQ-R) (Moss-Morris et al., 2002), which has 37 items. The IPQ-R has been used in studies which examined the different dimensions of the patients' views about illness. This measure has shown satisfactory internal reliability (Searle, Norman, Thompson, & Vedhara, 2007). The IPQ-R has seven subscales: timeline acute/chronic (e.g., "My illness last a short time"), timeline cycle (e.g., "My illness is very unpredictable), consequences (e.g., "My illness causes difficulties for those who are close to me"), personal control (e.g., "I have the power to influence my illness"), treatment control (e.g., "My treatment can control my illness"), illness coherence (e.g., "I don't understand my illness), and emotional representations (e.g., "My illness makes me feel angry").

The IPQ-R has also been used to look into the partner's perceptions of the patients' illness (Benyamini et al., 2007; Heijmans et al., 1999). For the current study, the words were slightly reworded for the partners (e.g., "My partner's diabetes will last a short time", "My partner's diabetes is a serious condition", " There is a lot which my partner can do to control his/her symptoms", My partner's illness is very unpredictable").

Both patients and partners rated each item on a scale from 1 (strongly agree) to 5 (strongly disagree). The following subscales consisted of six items each: timeline (α = .86 for patients and α = .79 for partners), consequence (α = .80 for patients and α = .77 for partners), personal control (α = .77 for patients and α = .71 for partners), and emotional representation (α = .89 for patients and α = .87 for partners). The treatment control (α = .61 for patients and α = .48 for partners) and illness coherence (α = .91 for patients and α = .83

for partners) subscales each consisted of five items; and the time cycle subscale (α = .89 for patients and α = .88 for partners) consisted of four items.

4.3.3. Support seeking behaviour

The measure of support seeking behaviour was adapted from Barbee and Cunningham's (1990) Support Activation Behavior Coding System. I adapted this coding system instead of using a validated self-report scale to measure support seeking behaviour because there is no such measures available; the self-report measures either measure perceived or received support but not the way in which support is sought. The Support Activation Behavior Coding System evaluates different behaviours used to elicit supportive behaviours. For the purposes of the present study, the codes from the Support Activation Behavior System were modified and transformed to statements to conform to a questionnaire format (e.g., the code "Asks for reassurance: asks for physical support, a hug, or kiss, requests understanding" was modified to "I ask my partner to hug or comfort me").The scale used in the present study included 21 items that reflected different ways of seeking support from one's partner: Each item began with the phrase "When I have a problem or something is bothering me…" Participants were asked about the ways they seek help and support from their partner by choosing from a 4-point scale (1= never, 4= very often) the one that corresponds to the frequency that they have used each of these support seeking behaviours in general.

The 21 items, using patients' Time 1 data, were subjected to principal component analysis (PCA). Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .79 and Bartlett's Test of Sphericity was 876.03 ($p < .001$), both tests showed that the data were suitable to undergo factor analysis. Because the Support Activation Behavior Coding System (Barbee & Cunninghan, 1990), from which the present study's support seeking scale was adapted, had

four dimensions (direct-verbal, direct-nonverbal, indirect-verbal, and indirect-nonverbal), a four-component PCA was initially run. However, results showed that five items loaded significantly (at least .30) on two components. To see if lessening the number of components from four to two would lessen the number of cross-loadings, the items were subjected to a two-component PCA using varimax rotation. The rotated solution presented two components, each one with a number of items showing strong loadings and all items loading significantly on only one component (see Table 4.3). The results of factor analysis supported the use of two components, identified as overt support seeking behaviour (eigenvalue = 7.11 and explaining 33.84 % of the variance) and covert support seeking behaviour (eigenvalue = 3.74 and explaining 17.31 % of the variance). Cronbach's alpha for the 10 overt support seeking items were .92 for patients and .89 for partners; and for the 11 covert support seeking items were .84 for patients and .78 for partners.

Table 4.3: Principal Components Analysis (Varimax Rotation) Loadings for Support seeking Items

Items	Component 1 (Overt)	Component 2 (Covert)
I ask my partner to help me with the situation.	.86	.01
I tell my partner that I need his/her help.	.83	.03
I talk to my partner about how I feel.	.83	-.14
I ask my partner for advice about what to do.	.82	-.11
I talk to my partner to find out more about the situation.	.79	-.18
I try to get emotional support from my partner.	.75	-.10
I ask my partner to hug or comfort me.	.74	-.07
I discuss my feelings with my partner.	.72	-.38
I ask my partner to take my mind off things (for example, by telling a joke, talking about happy things).	.66	.02
I ask my partner to do things with me to think about it less (for example, watch TV, go to the cinema, and go for a walk).	.59	.00
I refuse to talk about it when my partner asks me questions about the situation	-.21	.82
I avoid looking directly at my partner when he/she asks me about the problem.	-.11	.77
I go very quiet when my partner asks me if something is bothering me.	-.18	.71
I avoid being physically close to him/her when we talk about the situation.	-.19	.70
I pretend that it doesn't bother me.	-.24	.63
I try to mask my true feelings by making a joke about the situation when I tell him/her about it.	.12	.57
I avoid talking to my partner about it.	-.43	.53
I complain to my partner about the situation, but I don't ask him/her for help.	-.12	.53
I get irritated with my partner.	.01	.51
I laugh about the situation when I tell him/her about it to cheer myself up.	.21	.48
I tend to take my frustrations out on my partner.	.02	.46

4.3.4. Supportive interactions, satisfaction with support received, and negative interactions

The receipt of emotional and instrumental support was assessed using ten items based on van Sonderen's Social Support List Interactions (van Sonderen, 1933). The participants were asked how often in the past week they received certain kinds of support from their partner. Each sentence started with the phrase "In the past week, how often did your partner…" The instrumental subscale (e.g., "…take over some of your chores/responsibilities in and around the house", "…give you information or advice?") consisted of four items ($\alpha = .87$ for patients and $\alpha = .66$ for partners) and the emotional subscale (e.g., "…show that he/she loved and cared for you?", "…show that he/she appreciated you?") consisted of six items ($\alpha = .86$ for patients and $\alpha = .81$ for partners). The items were measured on a 4-point scale (1 = never, 4 = very often).

The receipt of negative interactions was measured using six questions ($\alpha = .90$ for patients and $\alpha = .82$ for partners) also based on the Social Support List Interactions (van Sonderen, 1933). Participants were asked how often they behaved negatively towards their partner in the past week (e.g., "How often in the past did it happen that you criticized your partner?") and how often they experienced negative response from their partner in the past week (e.g., "How often in past week did it happen that your partner criticized you?"). The items were measured on a 4-point scale (1 = never, 4 = very often).

Lastly, there was one item which asked the participants about their level of satisfaction with the support they received from their spouse ("All things considered, how satisfied were you with the support and help you received from your partner in the past

week?). There item was measured using a 5-point scale (1= not at all satisfied, 5 = extremely satisfied).

4.3.5. Health outcomes

4.3.5.1.Measures completed by patients and partners

4.3.5.1.1. Health-related quality of life

To assess the participants' health-related quality of life, The Short form health survey (SF-12) (Ware, Kosinski, & Keller, 1996) was used. This measure was shown to be a valid (Lee, Browell, & Jones, 2008) and a good alternative to the SF-36 (Gandek et al., 1998). The SF-12 includes items concerning physical health and mental health. Physical health items reflect: physical functioning (e.g., "Does your health limit you in moderate activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf?"), effect of physical health on usual activities (e.g., "During the past week, how much of the time have you accomplished less than you would like as a result of your physical health?"), bodily pain (e.g., "During the past week, how much did pain interfere with your normal work?"), and general health (e.g., "In general, how would you say your health is?"). Mental health items reflect: mental health status (e.g., "How much of the time during the past week have your felt calm and peaceful?"), effect of mental health on usual activities ("During the past week, how much of the time have you not done work activities as carefully as usual as a result of emotional problems?"), vitality (e.g., "How much of the time during the past week have you felt downhearted and depressed?"), and social functioning (e.g., "During the past week, how much of the time has your physical health or emotional problems interfered with your social

activities?"). Items are measured on different rating scales. The rating scales were all transferred to 5-point scales. (A 3-point scale is used to measure the 2 items on physical functioning: 1 = "yes, limited a lot" and 3 = "no, not limited at all"). A 5-point scale was used to measure the other 10 items: for the general health item, 1 = excellent and 5 = poor; for the bodily pain item, 1 = not at all and 5 = none of the time). Both the physical (α = .87 for patients and α = .88 for partners) and mental (α = .86 for patients and α = .86 for partners) subscales consisted of six items each.

4.3.5.1.2. Psychological distress

Distress level of both members of the couples was measured using the Center for Epidemiologic Studies-Depression (CES-D), a scale developed to assess depressive symptoms in the general population, (Radloff, 1977) and which has demonstrated good reliability (Schroevers, Ranchor, & Sanderman, 2003). The questionnaire has 20 statements about different depressive emotions and behaviours, e.g., "I was bothered by things that usually don't bother me" and "I did not feel like eating; my appetite was poor". The participants were asked how often during the past week did they experience each one. They used a scale from 1 ("rarely or none of the time—less than 1 day") to 4 ("most or all of the time—5-7 days"). For the present study, the Cronbach's alpha for CES-D was .89 and .84 for patients and partners, respectively.

4.3.5.2.Measures completed by patients only

4.3.5.2.1. Diabetes well-being

To have a better assessment of the patient's diabetes well-being or the patients' well-being in the context of dealing and coping with their diabetes, the patients completed two measures and their scores in these two measures were combined. These two measures were the Diabetes Quality of Life Measure (DQOL) satisfaction subscale (Jacobson, A. M. and The Diabetes Control and Complications Trial Research Group, 1994) and the Problem Areas in Diabetes Questionnaire or PAID (Polonsky et al., 1995). The two measures were combined to measure diabetes well-being so that diabetes well-being would include both the patients' diabetes-specific quality of life and their diabetes-specific distress. The participants' z-scores for DQOL satisfaction subscale and PAID were summed and considered as the score for the diabetes well-being.

The DQOL satisfaction subscale assesses the patients' diabetes-specific quality of life. The 15 items ($\alpha = .93$) of this subscale inquire about the level of satisfaction on areas such as: diabetes management, diet, consequences on their families, patients' knowledge about diabetes, sleep, social relationships, sex life, work and household activities, appearance of their bodies, leisure time, and life in general. Each sentence begins with the statement: "How satisfied are you with…" Patients used a scale from 1 (very satisfied) to 5 (very dissatisfied).

PAID assesses the emotional distress brought about by diabetes. It gives a list of 20 issues that are part of a diabetes patient's life, and asks if each is "currently a problem" for the patient. It covers the following areas: diabetic care, management, and treatment (e.g., "Not having clear and concrete goals for your diabetes care?" and "Feeling discouraged with

your treatment plan?"); uncomfortable social situations (e.g., "Uncomfortable social situations related to your diabetes care?"), diet (e.g., "Feelings of deprivation regarding food and meals?"), moods (e.g., "Not knowing if your mood or feelings are related to your diabetes?"), acceptance of the diabetes (e.g., "Not 'accepting' your diabetes?"), complications brought about by diabetes (e.g., "Worrying about the future and the possibility of serious complications?"), and lack of social support (e.g., "Feeling alone with your diabetes?"). In the present study, one item on weight management was added to this scale ("Feeling discouraged with your weight management?"). In answering the items, patients had to choose from a 5-point scale with choices from "not a problem" (0), through "moderate problem" (2), to "serious problem" (4). PAID's Cronbach's alpha for the current study was .97.

For a summary of measures used in the current study, see Table 4.4.

Table 4.4: Summary of Measures

Measures for	Completed by	Time point
Independent variables		
Attachment	Patient and Partner	T1
Illness Perception	Patient and Partner	T1
Support variables		
Support seeking behaviour	Patient and Partner	T1
Social support interactions and negative interactions received in the past week	Patient and Partner	T1 and T4
Satisfaction with Social support received in the past week	Patient and Partner	T1 and T4
Health outcomes		
Generic measures		
Psychological distress	Patient and Partner	T1 and T4
Health related-quality of life Physical health subscale Mental health subscale	Patient and Partner	T1 and T4
Diabetes well-being[1]		
Diabetes-specific distress[2]	Patient	T1 and T4
Diabetes-specific quality of life[3]	Patient	T1 and T4

[1, 2, 3]The z-scores for diabetes-specific distress and for diabetes-specific quality of life were combined as one score to measure diabetes well-being. Please see Table 5.1, 5.2, 5.11, and 5.12.

5. RESULTS 1

ATTACHMENT, SUPPORT SEEKING, SUPPORTIVE, AND NEGATIVE INTERACTIONS, AND HEALTH OUTCOMES

This chapter discusses the results of the first half of the study which examines: (a) the relationship between attachment and health outcomes; (b) attachment and supportive and negative interactions; (c) supportive and negative interactions and health outcomes; and (d) the mediating role of spousal supportive and negative interactions in the relationship between attachment and health outcome. The presentation of results is divided into two parts: cross-sectional results (Section 5.2) and longitudinal results (Section 5.3). The relationships among attachment, supportive and negative interactions, and health outcomes are discussed in both cross-sectional and longitudinal parts; while the role of supportive and negative interactions in mediating between attachment and health outcomes is discussed in cross-sectional part only.

5.1.Overview of Analyses

For the cross-sectional study, two statistical techniques were conducted to analyze the data: preliminary bivariate analysis; and mediational path analysis through Structural Equation Modeling (SEM) with dyadic data using bootstrapping to compute for the *total*, *direct*, and *indirect effects*. The cross-sectional study made use of data from study entry, which was the first time point of the study (Time 1).

The cross-lagged section (Section 5.3.3) of the longitudinal study made use of data from two time points: from study entry (which will be referred to as Time 1) and from six months after (Time 4).

5.2.Cross-sectional results

5.2.1. Descriptive analysis

Means and standard deviations of patient and partner variables and within-couple correlations are presented in Table 5.1. On average, both patients and partners reported relatively low levels of psychological distress. A paired t-test showed that these levels did not differ between patients and partners, $t(69) = 1.59$, *ns*. Both patients and partners also reported relatively high levels of physical health, with partners reporting significantly higher levels compared to patients, $t(69) = 2.02$, $p < .05$. Table 5.1 further shows that patients reported relatively low levels of diabetes-specific distress and relatively high levels of diabetes-specific quality of life.

On average, patients and partners scored below the mid-point of the scale on attachment-anxiety and attachment-avoidance. Both patients and partners reported receiving emotional and instrumental support *"often"*; while receiving negative interactions *"sometimes"*. No significant differences were found between the reports of patients and partners on these variables, ts < 0.88, *ns*. Both patients and partners also reported receiving relatively high levels of emotional and instrumental support and low levels of negative interaction. Again, no differences were found between reports of patients and partners on these variables, ts < 0.29, *ns*. Patient and partner psychological distress, attachment anxiety,

covert and overt support seeking, emotional support received, satisfaction with support received and negative interactions received were positively correlated with each other.

Table 5.1: Means, SDs, and possible range of patient and partner variables

	Patient		Partner			
Measures	*M*	*SD*	*M*	*SD*	Within-couple Correlations	Possible Range
Psychological distress	1.55	0.51	1.45	0.39	.38**	1 - 4
Physical health	3.76	0.99	4.06	0.92	.08	1 - 5
Diabetes-specific distress	0.82	0.84	NA	NA	NA	0 - 4
Diabetes-specific quality of life	3.83	0.85	NA	NA	NA	1 - 5
Attachment-anxiety	2.79	1.00	1.93	0.96	.47**	1 - 7
Attachment avoidance	3.42	1.17	3.47	1.14	.04	1 - 7
Covert Support seeking	1.78	0.52	1.76	0.38	.28*	1 - 4
Overt Support seeking	2.59	0.65	2.57	0.57	.31**	1 - 4
Instrumental support received	2.58	0.66	2.58	0.57	.12	1 - 4
Emotional support received	2.91	0.70	2.92	0.57	.52**	1 - 4
Satisfaction with support received	4.24	0.95	4.14	0.78	.41**	1 - 5
Negative interactions received	1.49	0.55	1.43	0.42	.41**	1 - 4

Note: $N = 70$ couples. NA = not applicable. $^{*}p < .05$, $^{**}p < .01$.

5.2.2. Bivariate analysis

Table 5.2 and Table 5.3 present the correlations among patient variables and among partner variables (attachment, health outcomes and social support variables), respectively. In both patients and partners, attachment-anxiety was positively correlated with attachment-avoidance. Furthermore, in patients, attachment-anxiety and attachment-avoidance were correlated with all three health outcomes. As expected, patients with higher scores on attachment anxiety and avoidance reported more psychological distress, lower physical health and lower diabetes well-being. In partners, attachment-anxiety was correlated only with psychological distress; whereas attachment-avoidance was not correlated with psychological distress and with physical health. Furthermore, both dimensions of attachment, in patients

and partners, were positively correlated with covert support seeking. However, only attachment-anxiety was correlated with the remaining social support variables: more anxious patients and partners reported receiving less emotional support, were less satisfied with the support they received and reported more negative interactions.

Patient and partners who reported higher levels of psychological distress (and lower levels of diabetes well-being for patients) reported more covert support seeking behaviours, less satisfaction with support and more negative interactions with their partner. In patients, higher levels of psychological distress (but not diabetes well-being) were also related to receiving less emotional support. Physical health was unrelated to any of the social support variables. This was true for both patients and partners.

The two types of support seeking behaviour, covert and overt, were significantly negatively correlated with each other in patients, but not in partners. In patients, covert support seeking behaviour was related to lower satisfaction with support and more negative interactions, whereas overt support seeking was related to receiving more emotional and instrumental support and higher satisfaction with social support. Moderate to strong positive correlations were found between the receipt of emotional and instrumental support and satisfaction with support (both patients and partners). Moreover, patients and partners who reported more negative interactions also reported receiving less emotional support (but not instrumental support) and were less satisfied with the support they received.

Table 5.2: Correlations among patient attachment, health outcomes, and social support variables

Patient Variables	1	2	3	4	5	6	7	8	9	10	11
1. Attachment-anxiety	1.000	.375**	.633**	-.265*	-.431**	.325**	.032	-.238*	.002	-.438**	.496**
2. Attachment-avoidance		1.000	.390**	-.258*	-.304*	.336**	- .124	-.031	.131	-.086	.195
3. Psychological distress			1.000	-.343**	-.708**	.578**	-.119	-.298*	-.054	-.548**	.614**
4. Physical health				1.000	-.346**	.188	.167	.026	.218	-.075	.198
5. Diabetes well-being					1.000	-.464**	-.019	.168	-.070	.398**	-.501**
6. Covert SS						1.000	-.288*	-.149	-.103	-.345**	.574**
7. Overt SS							1.000	.390**	.485**	.234+	-.090
8. Emotional SR								1.000	.600**	.692**	-.322**
9. Instrumental SR									1.000	.405**	-.053
10. Satisfaction with SR										1.000	-.537**
11. Negative IR											1.000

Note: *N=70 couples.* $^{*}p<.05$. $^{**}p<.01$.
SS = Support seeking; SR = Support received; IR = Interaction received.

Table 5.3: Correlations among partner attachment, health outcomes, and social support variables

Partner Variables	1	2	3	4	5	6	7	8	9	10
1. Attachment-anxiety	1.000	.361**	.273**	-.174	.346**	-.067	-.274*	-.114	-.283*	.438**
2. Attachment-avoidance		1.000	.051	.020	.311**	-.100	-.104	-.081	.034	.108
3. Psychological distress			1.000	-.518**	.321**	.103	.012	.114	-.316**	.414**
4. Physical health				1.000	-.203	.003	.097	-.076	.231	-.190
5. Covert SS					1.000	-.167	-.255*	-.082	-.185	.188
6. Overt SS						1.000	.587**	.440**	.291*	-.172
7. Emotional SR							1.000	.638**	.410**	-.293**
8. Instrumental SR								1.000	.354**	-.109
9. Satisfaction with SR									1.000	-.495**
10. Negative IR										1.000

Note: *N=70 patients and partners.* $^{*}p<.05$. $^{**}p<.01$.
SS = Support seeking; SR = Support received; IR = Interaction received.

As attachment-anxiety and attachment-avoidance were correlated with each other and both were correlated with the same health outcomes in patients, partial correlations were conducted to determine whether the overlap between the variables warranted including both attachment dimensions as independent variables in the subsequent mediation analyses (see Section 5.2.3). Table 5.4 presents the results of the partial correlations. After controlling for attachment-avoidance, the correlation between attachment-anxiety and psychological distress remained significant, in both patients and partners (see Table 5.4). The same was true for the correlation between attachment-anxiety and diabetes well-being in patients. In contrast, the correlations between attachment-avoidance, psychological distress, and diabetes well-being became non-significant once attachment was controlled for (see Table 5.4). For this reason, only attachment-anxiety was used as the independent variable in the subsequent mediation and cross-lagged analyses. Although, the correlation between attachment-anxiety and physical health was non-significant for partners and became non-significant for patients after controlling for attachment-avoidance, I decided to also examine attachment-anxiety as the independent variable in the mediation analyses with physical health to remain consistent with analyses for the other health outcomes.

Table 5.4: Partial correlations between attachment and health outcomes

	Health outcome			
Attachment	Psychological distress	Physical health	Diabetes well-being	Control variable
Patient				
Anxiety	.570***	-.188	-.359**	Avoidance
Avoidance	.213+	-.178	-.170	Anxiety
Partner				
Anxiety	.274*	-.194	NA	Avoidance
Avoidance	-.053	.090	NA	Anxiety

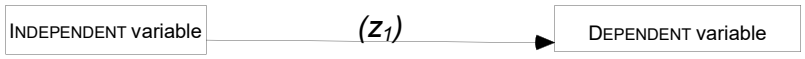
Note: *N=70 couples.* $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

5.2.3. Mediational Path analysis

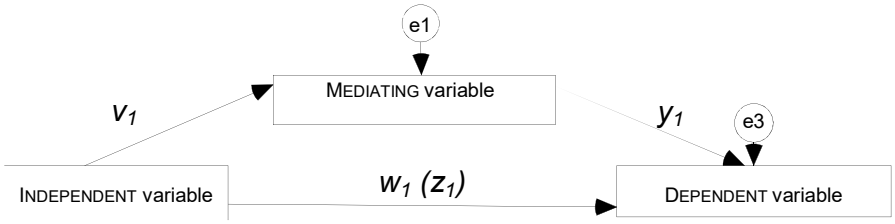
The next step was to conduct mediational path analyses through structural equation modeling (SEM) using AMOS 17. The objectives of these analyses were to examine the associations between: (1) attachment-anxiety,(the independent variable), and social interaction variables (the mediating variables) (Hypotheses 1 and 2); (2) social interaction variables and health outcome variables, (the dependent variable) (Hypothesis 4); (3) attachment-anxiety and health outcome variables prior to controlling for the social interaction variables (Hypothesis 3); and (4) to test if there was a significant decrease in the association between attachment-anxiety and health outcome variable when the social interaction variable was controlled for. These objectives coincide with examining the necessary conditions for the establishment of a mediational relationship (Hypothesis 5) as suggested by Baron& Kenny (1986). If the result for each one of these relationships is significant, then it can be established that the relationship between attachment-anxiety and health outcome variable is mediated by a social interaction variable.

When establishing a mediational relationship using path analysis, three types of effects are examined: *total*, *direct*, and *indirect*. In Figure 5.1 A, Path (*z1*) represents the *total effect* of the independent variable on the dependent variable. In Figure 5.1 B, the mediating variable has been included in the model. Path *v1* represents the *direct effect* of the independent variable on the mediating variable and Path *y1* represents the *direct effect* of the mediating variable on the dependent variable. Now, the independent variable exerts its effect on the dependent variable via two paths: (1) from independent variable directly to the dependent variable; and (2) from independent variable, through the mediating variable, to the dependent variable. Path *w1* represents the *direct effect* of the independent variable on the

dependent variable when the mediating variable is controlled for; while the product of *v1y1* (not shown in the figure) represents the *indirect effect* of the independent variable on the dependent variable going through the mediating variable. Total effect is the sum of *direct effect* and *indirect effect*: (*z1*) = *w1* + *v1y1*. A significant *indirect effect* is reflective of a significant reduction in the magnitude of the direct association between the independent variable and the dependent variable when the mediating variable is controlled for. To satisfy the requirements for mediation, the following have to be significant: (1) the *direct effect* of the independent variable on the mediating variable, (2) the *direct effect* of the mediating variable on the dependent variable, (3) the *total effect* of the independent variable on the dependent variable, and (4) the *indirect effect* of the independent variable on the dependent variable through the mediating variable.



A



B

Figure 5.1 A: Total effect of the independent variable on the dependent variable;
B: Mediational model illustrating total and direct effects of the variables.

5.2.3.1. Actor and spouse models

For every set of variables (i.e., attachment-anxiety, social interaction and health outcome), two mediational models were examined: the actor model which examined if a participant's social interaction variables mediated the relationship between his or her attachment variables and health outcomes; and the spouse model which examined if a spouse's social interaction variables mediated the relationship between a participant's attachment variables and health outcomes.

Specifically, the first model (actor model), as shown in Figure 5.2, is testing the effect of actor attachment-anxiety on actor health outcome variable with actor social interaction as the mediating variable (paths *a, b, c* and *d* with the patient as the actor and paths *g, h, i,* and *j* with the partner as the actor). In this model, paths *a, g, b,* and *h* examine the *direct effect* of actor attachment-anxiety on actor social interaction, and actor social interaction on actor health outcome, respectively. Paths *c* and *i* examine the *total effect* of actor attachment-anxiety on actor health outcome. Paths *d* and *j* examine the *direct effect* of actor attachment-anxiety on actor health outcome, whilst controlling for actor social interaction variable. In the middle part of the model there is a crossing over from patient to partner and from partner to patient, respectively. Path *e* represents the *direct effect* of patient attachment-anxiety on partner health outcome variable; while Path *f* represents the *direct effect* of partner attachment-anxiety on patient health outcome variable.

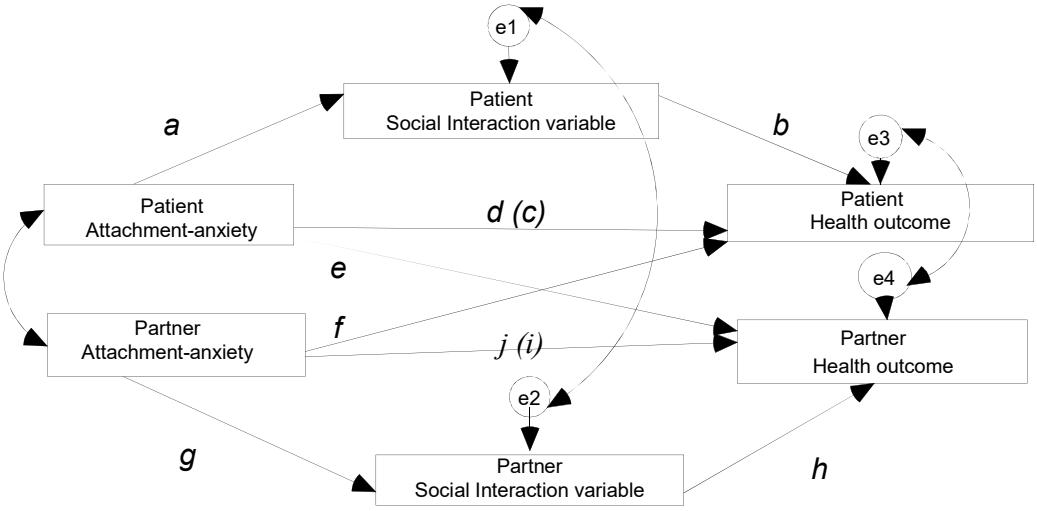


Figure 5.2: Mediational model testing the effect of actor attachment-anxiety on actor health outcome with actor social interaction as the mediating variable.

The second model (spouse model), as shown in Figure 5.3, is testing the effect of *actor* attachment-anxiety on *actor* health outcome variable with *spouse* social interaction as the mediating variable. In this model, paths *k, l, o*, and *p* examine the *direct effect* of actor attachment-anxiety on spouse social interaction, and spouse social interaction on actor health outcome, respectively. Path *m* and *q* examine the *total effect* of actor attachment anxiety on actor health outcome, and paths *n* and *r* examine the *direct effect* of actor attachment-anxiety on actor health outcome whilst controlling for spouse social interaction. Paths *e* and *f* are the same as in Figure 5.2 and examine the *direct effect* of actor attachment-anxiety on spouse health outcome.

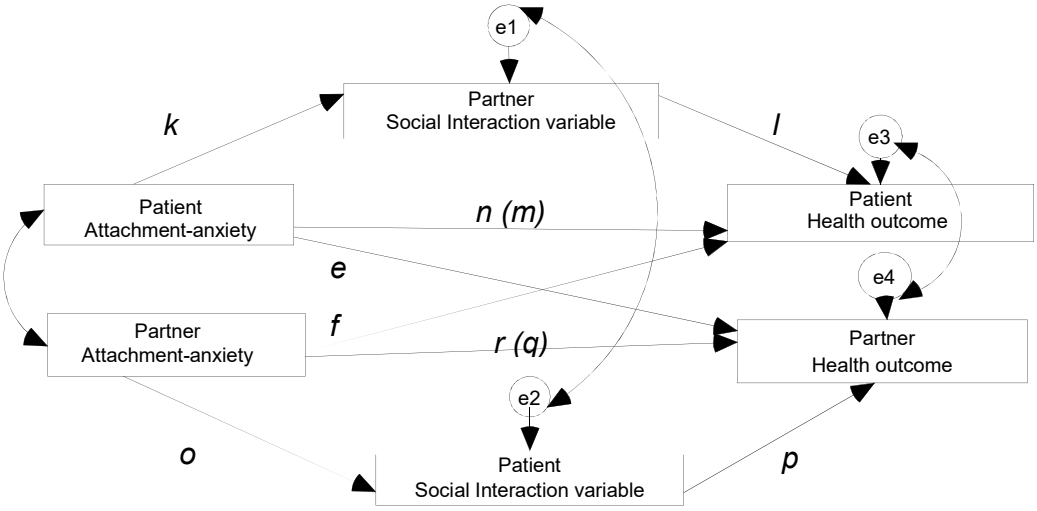


Figure 5.3: Mediational model testing effect of actor attachment-anxiety on actor health outcome with spouse social interaction as the mediating variable.

As the third health outcome variable, diabetes well-being, was measured in patients only the models with diabetes well-being as the dependent variable were slightly different from the models described above. These models are shown in Figure 5.4 and Figure 5.5.

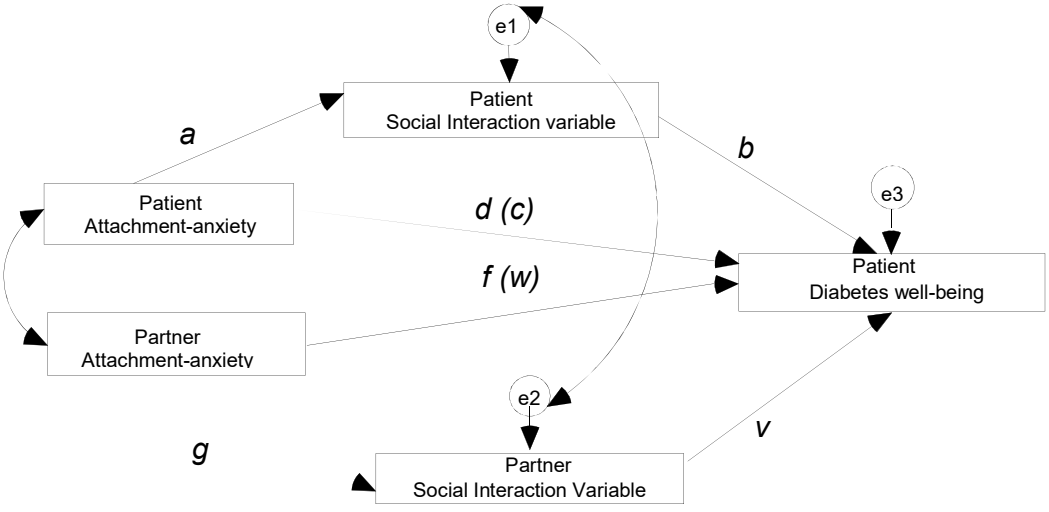


Figure 5.4: Mediational model testing the effect of patient attachment-anxiety on patient diabetes well-being with patient social interaction as the mediating variable, and partner attachment-anxiety on patient diabetes well-being with partner social interaction as the mediating variable.

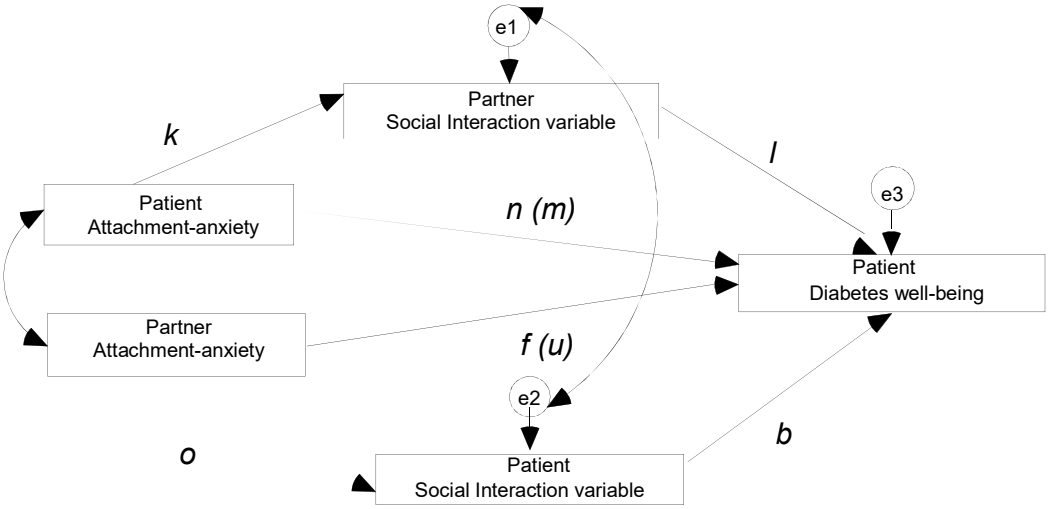


Figure 5.5: Mediational model testing the effect of patient attachment-anxiety on patient diabetes well-being with partner social interaction as the mediating variable, and partner attachment-anxiety on patient diabetes well-being with patient social interaction as the mediating variable.

In Sections 5.2.3.2.1 to 5.2.3.2.3 models with *support seeking behaviour* (covert and overt) as the social interaction variable are presented; while in Sections 5.2.3.3.1 to 5.2.3.3.3, the models with *receipt of supportive and negative interaction variables* (instrumental, emotional, satisfaction, and negative interaction) are discussed. For the health outcome variables: psychological distress is presented first, followed by physical health, then by diabetes well-being. Standardized estimates and standard errors of the *direct effects*, *total effects* and *indirect effects* are presented in Table 5.5 to Table 5.10.

5.2.3.2. Attachment-anxiety, support seeking, and health outcomes

5.2.3.2.1. Psychological distress

Table 5.5 presents the results for actor effects and spouse effects of attachment-anxiety on psychological distress, examining covert and overt support seeking behaviours as potential mediators. Starting with actor effect (top half of the table), Table 5.5 shows that, as hypothesized (Hypothesis 3a and Hypothesis 3b, respectively), more anxiously attached patients reported higher levels of psychological distress (*total effect*, path *c*) and had spouses who reported higher levels of psychological distress (path *e*). However, against predictions, partner attachment-anxiety was unrelated to their own psychological distress (*total effect*, path *i*) or their spouse's (path *f*).

Table 5.5 further shows that, in accordance with Hypothesis 1a, more anxiously-attached patients (path *a*) and partners (path *g*) engaged in more covert support seeking, compared to those less-anxiously attached. Covert support- seeking in turn was related to higher levels of psychological distress in patients (path *b*) (Hypothesis 4a), but not in partners (path *h*). Finally, the *indirect effect* of attachment-anxiety on psychological distress was significant for patients but not for partners (see Table 5.5). This means that for patients the requirements for mediation were met (support for Hypothesis 5). As the *direct effect* of patient attachment-anxiety on patient psychological distress remained significant (path *d*) after covert seeking support was controlled for, mediation was partial rather than full. More anxiously-attached patients used more covert support seeking, and more covert support seeking in turn was related to higher psychological distress. Although, attachment-anxiety was also related to covert support seeking in partners, this did not result in higher levels of psychological distress.

With respect to overt support seeking behaviour, no significant relationships were found (see Table 5.5). Attachment-anxiety was unrelated to overt support seeking behaviour (paths *a* and *g*) (contrary to Hypothesis 1a), and overt support seeking behaviour was unrelated to psychological distress (paths *b* and *h*) (contrary to Hypothesis 4a).This was true for patients as well as partners.

The lower half of Table 5.5 presents the models examining spouse effects. More anxiously attached patients and partners had a spouse who engaged in more covert support seeking behaviour (path *k* and *o*), as hypothesized (Hypothesis 1b). However, spouse covert support seeking behaviour was not related levels of psychological distress in patients (path *l*) or in partners (path *p*). No relationships were found with spouse overt support seeking behaviour as the intended mediator.

Table 5.5: Actor effects and spouse effects of attachment-anxiety on psychological distress (DV) through support seeking behaviour (Mediator)

		Covert		Overt	
Actor effects		*Beta*	*SE*	*Beta*	*SE*
Patient	anxiety → mediator (path *a*)	.297**	.094	.001	.120
	mediator → psych distress (path *b*)	.394**	.112	-.113	.088
	anxiety → psych distress (path *d*)	.473***	.089	.581***	.079
	anxiety → psych distress ^{spouse} (path *e*)	.231*	.115	.272*	.125
	anxiety → psych distress(*total effect*, *path c*)	.590***	.078	.581***	.078
	anxiety → psych distress (*indirect effect*)	.117**	.056	.000	.017
Partner	anxiety → mediator (path *g*)	.330*	.141	-.027	.103
	mediator → psych distress (path *h*)	.208	.169	.054	.117
	anxiety → psych distress (path *j*)	.096	.156	.150	.159
	anxiety → psych distress ^{spouse} (path *f*)	.087	.083	.119	.084
	anxiety → psych distress(*total effect,* path *i*)	.164	.150	.149	.158
	anxiety → psych distress (*indirect effect*)	.069+	.058	-.001	.014
Spouse effects					
Patient	anxiety → mediator ^{spouse} (path *k*)	.330*	.113	.065	.139
	mediator ^{spouse} → psych distress (path *l*)	.045	.102	.111	.113
	anxiety → psych distress(path *n*)	.558***	.086	.551***	.084
	anxiety → psych distress ^{spouse} (path *e*)	.254*	.118	.282*	.121
	anxiety → psych distress(*total effect, path m*)	.573***	.081	.558***	.082
	anxiety →psych distress (*indirect effect*)	.015	.035	.007	.026
Partner	anxiety → mediator ^{spouse} (path *o*)	.233*	.098	-.097	.100
	mediator ^{spouse} → psych distress (path *p*)	.111	.129	-.020	.103
	anxiety → psych distress (path *r*)	.129	.161	.139	.158
	anxiety → psych distress ^{spouse} (path *f*)	.129	.090	.155	.086
	anxiety → psych distress (*total effect,* path *q*)	.155	.151	.140	.155
	anxiety → psych distress (*indirect effect*)	.026	.033	.002	.015

Note: $N = 70$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

5.2.3.2.2. Physical health

Table 5.6 presents the results for actor effects and spouse effects of attachment-anxiety on physical health, examining covert and overt support seeking behaviours as potential mediators. Although the bivariate correlations showed a significant relationship between attachment-anxiety and physical health in patients, the relationship was no longer significant at the $p < .05$ level in the mediational models (see Table 5.6; *total effect*, path *c*), which was contrary to Hypothesis 3a . There were also no significant relationships between partner attachment anxiety and partner physical health (path *i*). Furthermore, no significant relationships were shown between actor attachment anxiety and spouse physical health (paths *e* and *f*).

Support seeking (both covert and overt) was unrelated to actor's own (paths *b* and *h*) and their spouse's (paths *l* and *p*) physical health (contrary to Hypothesis 4a). Furthermore, none of the *indirect effects* were significant.

Table 5.6: Actor effects and spouse effects of attachment-anxiety on physical health (DV) through support seeking behaviour (Mediator)

		Covert		Overt	
Actor effects		*Beta*	*SE*	*Beta*	*SE*
Patient	anxiety →mediator (path *a*)	.297	.094	.001	.120
	mediator →physical health (path *b*)	-.101	.135	-.178	.127
	anxiety →physical health (path *d*)	-.188	.123	-.193	.116
	anxiety →physical health ^{spouse} (path *e*)	-.209	.139	-.241^{+}	.136
	anxiety →physical health (*total effect*, path *c*)	-.218^{+}	.120	-.193	.125
	anxiety →physical health (*indirect effect*)	-.030	.043	.000	.025
Partner	anxiety →mediator (path *g*)	.330	.141	-.027	.103
	mediator →physical health (path *h*)	-.116	.143	.021	.124
	anxiety →physical health (path *j*)	-.036	.153	-.059	.159
	anxiety →physical health ^{spouse} (path *f*)	-.094	.143	.140	.145
	anxiety →physical health (*total effect,* path *i*)	-.074	.157	-.060	.157
	anxiety →physical health (*indirect effect*)	-.038	.052	-.001	.013
Spouse effects					
Patient	anxiety →mediator ^{spouse} (path *k*)	.330**	.113	.065	.139
	mediator ^{spouse} →physical health (path *l*)	-.026	.141	.014	.134
	anxiety →physical health (path *n*)	-.208^{+}	.124	-.216^{+}	.123
	anxiety →physical health ^{spouse} (path *e*)				
	anxiety →physical health (*total effect,* path *m*)	-.216^{+}	.123	-.216^{+}	.121
	anxiety →physical health (*indirect effect*)	-.009	.049	.001	.022
Partner	anxiety →mediator ^{spouse} (path *o*)	.233*	.098	-.097	.100
	mediator ^{spouse} →physical health (path *p*)	.027	.157	-.030	.120
	anxiety →physical health (path *r*)	-.066	.158	.068	.158
	anxiety → physical health ^{spouse} (path *f*)	-.102	.149	-.106	.143
	anxiety → physical health (*total effect,* path *q*)	-.060	.154	-.065	.155
	anxiety → physical health (*indirect effect*)	.006	.042	.003	.017

Note: $N = 70$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$.

5.2.3.2.3. Diabetes well-being

More anxiously attached patients reported lower levels of diabetes well-being (see Table 5.7; *total effect*, path *c*) and this relationship was mediated by covert support seeking, as hypothesized (Hypothesis 3a and Hypothesis 5, respectively): more anxiously attached patients reported more covert support seeking (path *a*) (confirming Hypothesis 1a) and covert support seeking in turn was related to lower levels of diabetes well-being (path b) (confirming Hypothesis 4a). The *indirect effect* of attachment-anxiety on diabetes well-being was significant with covert support seeking as the mediator (see Table 5.7). Finally, the *direct effect* of attachment-anxiety on diabetes well-being was no longer significant once covert-support seeking was included (path *d*: β = -.219, p = .066), indicating full mediation (as expected in Hypothesis 5).

With respect to overt support seeking behaviour, no significant relationships were found (see Table 5.7). In a similar vein, no significant relationships were found for the spouse model (both covert and overt support seeking).

Table 5.7: Actor effects and spouse effects of attachment-anxiety on diabetes well-being (DV) through support seeking behaviour (Mediator)

		Covert		Overt	
Actor effects		*Beta*	*SE*	*Beta*	*SE*
Patient	anxiety →mediator (path *a*)	.297**	.094	.001	.120
	mediator →diabetes well-being (path *b*)	-.328*	.131	-.003	.131
	anxiety →diabetes well-being (path *d*)	-.219+	.110	-.307**	.111
	anxiety → diabetes well-being (*total effect*, path *c*)	-.316*	.116	-.307**	.110
	anxiety →diabetes well-being (*indirect effect*)	-.098*	.055	.000	.016
Partner	anxiety → mediator (path *g*)	.330*	.141	-.027	.103
	mediator →diabetes well-being (path *v*)	-.101	.138	-.117	.137
	anxiety →diabetes well-being spouse (path *f*)	-.161	.135	-.243	.106
	anxiety →diabetes well-being spouse (*total effect,* path *w*)	-.195+	.110	-.240+	.105
	anxiety → diabetes well-being spouse (*indirect effect*)	-.033	.059	.003	.019
Spouse effects					
Patient	anxiety →mediator spouse (path *k*)	.330**	.113	.065	.139
	mediator spouse →diabetes well-being (path *l*)	-.102	.139	-.116	.135
	anxiety →diabetes well-being (path *n*)	-.220+	.112	-.306**	.111
	anxiety →diabetes well-being (*total effect,* path *m*)	-.254*	.110	-.313**	.108
	anxiety →diabetes well-being (*indirect effect*)	-.034	.048	-.008	.028
Partner	anxiety → mediator spouse (path *o*)	.233*	.098	-.162	.135
	anxiety →diabetes well-being spouse (path *f*)	-.162	.135	-.242*	.105
	anxiety →diabetes well-being spouse (*total effect,* path *u*)	-.240	.133	-.242*	.108
	anxiety → diabetes well-being spouse (*indirect effect*)	-.077*	.049	.000	.019

Note: $N = 70$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$.

5.2.3.2.4. Summary

The hypotheses involving the relationship between attachment variables, support seeking behaviours, and health outcomes were only partly confirmed (Hypotheses 1, 3-5). It is important to note that of the two attachment variables, only attachment-anxiety was examined as independent variable after it was found, through partial correlations, that the correlation between attachment-anxiety and psychological distress, and between attachment-anxiety and diabetes well-being remained significant even after controlling for attachment-avoidance; whereas, the correlation between attachment-avoidance and the abovementioned health outcomes became non-significant after controlling for attachment-anxiety. Attachment-anxiety was positively related to their own (Hypothesis 3a) and their spouse's psychological distress (Hypothesis 3b) in the case of patients, but not in the case of partners. In addition, patient attachment-anxiety was directly associated with their diabetes well-being (Hypothesis 3a). In accordance with the hypothesis with regard mediation (Hypothesis 5), covert support seeking mediated the relationships between patient attachment-anxiety and their psychological distress, and between patient attachment-anxiety and their diabetes well-being. Although more anxiously attached partners also reported more covert support seeking behaviour (support for Hypothesis 1a), covert support seeking behaviour was unrelated to their health outcomes (contrary to Hypothesis 4a).

5.2.3.3. Attachment-anxiety, supportive and negative interactions, and health outcomes

5.2.3.3.1. Psychological distress

More anxiously attached patients and partners received less emotional support (path *a*) and more negative interactions (paths *g*) (as expected in Hypothesis 2a) as can be seen in Table 5.8. In addition, more anxiously attached patients were less satisfied with the support they received (as expected in Hypothesis 2a). It can also be noted in Table 5.8 that patients and partners who received more negative interactions, experienced higher levels of psychological distress (paths *b* and *h*) (confirming Hypothesis 4b). Conversely, patients who were more satisfied with the support they received, experienced lower levels of psychological distress (supporting Hypothesis 4b), but partner support satisfaction was only marginally associated with their psychological distress. Lastly, for patients and partners, the *indirect effect* of attachment-anxiety on psychological distress through receipt of negative interactions, was significant (see Table 5.8, *indirect effect*). Also, for patients, but not for partners, the *indirect effect* of the path from attachment-anxiety on psychological distress through satisfaction with support received was significant.

For patients, but not for partners, mediational relationships were established, confirming Hypothesis 5. More anxiously attached patients received more negative interactions and were less satisfied with the support they received; in turn they experienced higher level of psychological distress. As the *direct effect* of patient attachment-anxiety on their psychological distress was still significant after controlling for receipt of negative interactions and support satisfaction, the mediation for each of the models was partial. Furthermore, patient and partner attachment-anxiety were unrelated to their receipt of instrumental support.

Similar to the results in Section 5.2.3.2.1 (relationship between attachment-anxiety and psychological distress with support seeking as mediator), patient attachment-anxiety was related to their spouse's psychological distress (path *e*) except in models with patient support satisfaction and patient receipt of negative interactions as mediating variables (see Table 5.8). On the contrary, partner attachment-anxiety was unrelated with their spouse's psychological distress (path *f*) in all models. It can also be seen in Table 5.8 that more anxiously attached patients had spouses who received more negative interactions (path *k*). However, partner attachment-anxiety was not related to their spouse's receipt of negative interactions.

Table 5.8: Actor effects and spouse effects of attachment-anxiety on psychological distress (DV) through support interactions (Mediator)

		Emotional support		Instrumental support		Support satisfaction		Negative interactions	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
Patient	anxiety →mediator (path *a*)	-.277**	.094	-.005	.130	-.396***	.100	.460***	.093
	mediator →psych distress (path *b*)	-.142	.116	-.020	.108	-.331***	.095	.395**	.121
	anxiety →psych distress (path *d*)	.541***	.092	.570***	.081	.437**	.096	.379***	.102
	anxiety →psych distress ^{spouse} (path *e*)	.275*	.122	.273*	.120	.235^{+}	.132	.212^{+}	.121
	anxiety →psych distress (*total effect,* path *c*)	.580***	.078	.570***	.078	.568***	.082	.560***	.084
	anxiety →psych distress (*indirect effect*)	.039	.039	.000	.014	.131***	.050	.182***	.075
Partner	anxiety →mediator (path *g*)	-.241*	.105	-.093	.139	-.257^{+}	.141	.428***	.094
	mediator →psych distress (path *h*)	.038	.117	.120	.118	-.240^{+}	.125	.345**	.109
	anxiety →psych distress (path *j*)	.155	.165	.160	.150	.096	.145	.024	.139
	anxiety →psych distress ^{spouse} (path *f*)	.123	.082	.136	.083	.116	.079	.131	.079
	anxiety →psych distress (*total effect,* path *i*)	.146	.157	.149	.154	.158	.161	.171	.161
	anxiety →psych distress (*indirect effect*)	-.009	.033	-.011	.026	.062^{+}	.051	.147**	.063
Spouse effects									
Patient	anxiety →mediator ^{spouse} (path *k*)	.085	.120	-.012	.133	-.174	.119	.269*	.127
	mediator ^{spouse} →psych distress (path *l*)	.030	.103	.033	.112	.004	.105	-.015	.136
	anxiety →psych distress (path *n*)	.562***	.081	.566***	.081	.567***	.082	.569***	.087
	anxiety → psych distress ^{spouse} (path *e*)	.284*	.121	.286*	.122	.294*	.126	.290*	.141
	anxiety → psych distress (*total effect,* path *m*)	.565***	.080	.565***	.081	.567***	.082	.565***	.079
	anxiety → psych distress (*indirect effect*)	.003	.016	.000	.016	-.001	.023	-.004	.041
Partner	anxiety → mediator ^{spouse} (path *o*)	-.036	.131	-.123	.114	-.200	.114	.174	.128
	mediator ^{spouse} →psych distress (path *p*)	.031	.124	-.075	.123	.041	.132	-.024	.146
	anxiety → psych distress (path *r*)	.145	.158	.128	.163	.136	.149	.142	.154
	anxiety → psych distress ^{spouse} (path *f*)	.149	.090	.144	.084	.140	.089	.144	.092
	anxiety → psych distress (*total effect, path q*)	.144	.156	.138	.156	.136	.149	.138	.160
	anxiety → psych distress (*indirect effect*)	-.001	.018	.009	.022	-.008	.031	-.004	.031

Note: $N = 70$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

5.2.3.3.2. Physical health

Patients who received more instrumental support experienced lower physical health (path *b*) as expected (Hypothesis 4b), but this was not the case for partners (path *h*), as shown in Table 5.9. Aside from this, there were no other significant relationships between supportive and negative interactions and physical health in both patients and partners; this is true for both actor and spouse (paths *l* and *p*) models. Furthermore, none of the *indirect effects* were significant (see Table 5.9; *indirect effect*). Thus, against expectations (Hypothesis 5), supportive and negative interactions did not mediate between attachment-anxiety and physical health in both patients and partners.

Table 5.9: Actor effects and spouse effects of attachment-anxiety on physical health (DV) through support interactions (Mediator)

		Emotional support		Instrumental support		Support satisfaction		Negative interactions	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
Patient	anxiety →mediator (path *a*)	-.277**	.094	-.005	.130	-.396***	.100	.460***	.093
	mediator →physical health (path *b*)	-.107	.118	-.247*	.109	-.057	.114	-.083	.150
	anxiety →physical health (path *d*)	-.234*	.119	-.191+	.112	-.238+	.132	-.173	.146
	anxiety →physical health spouse (path *e*)	-.247+	.133	-.231	.136	-.207	.135	-.219	.137
	anxiety →physical health (*total effect,* path *c*)	-.204+	.123	-.190	.121	-.215+	.121	-.212+	.121
	anxiety → physical health (*indirect effect*)	.030	.037	.001	.035	.023	.047	-.038	.068
Partner	anxiety →mediator (path *g*)	-.241*	.105	-.093	.139	-.257+	.141	.428***	.094
	mediator →physical health (path *h*)	.080	.138	-.092	.132	.164	.129	-.098	.126
	anxiety →physical health (path *j*)	-.035	.167	-.076	.157	-.031	.153	-.028	.154
	anxiety →physical health spouse (path *f*)	-.120	.144	-.152	.139	-.112	.147	-.106	.146
	anxiety → physical health (*total effect,* path *i*)	-.055	.157	-.067	.156	-.073	.155	-.071	.157
	anxiety → physical health (*indirect effect*)	-.019	.037	.009	.025	-.042	.041	-.042	.057
Spouse effects									
Patient	anxiety →mediator spouse (path *k*)	.085	.120	-.012	.133	-.174	.119	.269	.127
	mediator spouse → physical health (path *l*)	-.165	.118	.074	.107	.033	.138	-.019	.124
	anxiety → physical health (path *n*)	-.191	.123	-.219+	.122	-.208+	.129	-.211+	.122
	anxiety → physical health spouse (path *e*)	-.225	.134	-.252+	.132	-.183	.133	-.232+	.139
	anxiety → physical health (*total effect,* path *m*)	-.205+	.122	-.220*	.120	-.214+	.122	-.216+	.123
	anxiety → physical health (*indirect effect*)	-.014	.025	-.001	.018	-.006	.031	-.005	.036
Partner	anxiety → mediator spouse (path *o*)	-.036	.131	-.123	.114	-.200+	.114	.174	.128
	mediator spouse →physical health (path *p*)	.073	.130	.184	.142	.138	.133	-.011	.119
	anxiety →physical health (path *r*)	-.054	.160	-.029	.159	-.053	.161	-.062	.156
	anxiety →physical health spouse (path *f*)	-.161	.143	-.098	.145	-.102	.146	-.102	.145
	anxiety →physical health (*total effect, path q*)	-.057	.156	-.051	.155	-.080	.151	-.064	.155
	anxiety →physical health (*indirect effect*)	-.003	.021	-.023	.031	-.028	.037	-.002	.026

Note: $N = 70$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

5.2.3.3.3. Diabetes well-being

In the same way that covert support seeking mediated the relationship between attachment-anxiety and diabetes well-being (see Section 5.2.3.2.3), receipt of negative interactions also mediated the said relationship, as hypothesized (Hypothesis 5). Table 5.10 shows that more anxiously attached patients received more negative interactions (path *a*), in turn the more negative interactions they received, the lower levels of diabetes well-being they experienced (path *b*) (confirming Hypothesis 4b). Furthermore, the *indirect effect* of attachment-anxiety on diabetes well-being through receipt of negative interactions was significant (see Table 5.10). In addition, patients who scored higher on attachment-anxiety reported receiving less emotional support and were less satisfied with the support they received.

Looking at spouse effects (see Table 5.10), partners who received more negative interactions had spouses (patients) who reported experiencing lower levels of diabetes well-being. Aside from these relationships, there were no other significant findings.

Table 5.10: Actor effects and spouse effects of attachment-anxiety on diabetes well-being (DV) through support interactions (Mediator)

		Emotional support		Instrumental support		Support satisfaction		Negative interactions	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
Patient	anxiety →mediator (path *a*)	-.277**	.094	-.005	.130	-.396***	.100	.460***	.093
	mediator →diabetes well-being (path *b*)	.118	.147	-.076	.114	.248^{+}	.132	-.371**	.138
	anxiety →diabetes well-being (path *d*)	-.287**	.118	-.306**	.097	-.229^{+}	.116	-.144	.113
	anxiety → diabetes well-being (*total effect*, path *c*)	-.320**	.106	-.306**	.098	-.327*	.114	-.315*	.120
	anxiety →diabetes well-being (*indirect effect*)	-.033	.048	.000	.017	-.098*	.064	-.170*	.083
Partner	anxiety → mediator (path *g*)	-.241*	.105	-.093	.139	-.257^{+}	.141	.428***	.094
	mediator →diabetes well-being (path *v*)	-.131	.135	.184	.121	-.020	.135	.000	.137
	anxiety →diabetes well-being ^{spouse} (path *f*)	-.258^{+}	.116	-.266*	.113	.213^{+}	.111	-.219^{+}	.120
	anxiety →diabetes well-being ^{spouse} (*total effect,* path *w*)	-.226^{+}	.113	-.249^{+}	.113	-.208^{+}	.115	-.218^{+}	.109
	anxiety → diabetes well-being ^{spouse} (*indirect effect*)	.032	.038	.017	.032	.005	.004	.000	.062
Spouse effects									
Patient	anxiety →mediator ^{spouse} (path *k*)	.085	.120	-.012	.133	-.174	.119	.269*	.127
	mediator ^{spouse} →diabetes well-being (path *l*)	-.133	.135	-.184	.120	-.020	.135	.000	.137
	anxiety →diabetes well-being (path *n*)	-.286*	.118	-.305	.098	-.232^{+}	.119	-.148	.116
	anxiety → diabetes well-being(*total effect,* path *m*)	-.297*	.115	-.303**	.103	-.229^{+}	.116	-.148	.114
	anxiety → diabetes well-being(*indirect effect*)	-.011	.025	.002	.028	.003	.029	.000	.038
Partner	anxiety → mediator ^{spouse} (path *o*)	-.036	.131	-.123	.114	-.200^{+}	.114	.174	.128
	mediator →diabetes well-being ^{spouse} (path *p*)	.116	.144	-.075	.114	.253^{+}	.136	-.382*	.140
	anxiety →diabetes well-being ^{spouse} (path *f*)	-.256*	.113	-.265	.113	-.217^{+}	.111	-.224^{+}	.121
	anxiety →diabetes well-being (*total effect, path q*)	-.260^{+}	.113	-.256*	.109	-.267*	.113	-.290	.136
	anxiety →diabetes well-being (*indirect effect*)	-.004	.026	.009	.022	-.051	.045	-.067	.058

Note: $N = 70$ couples. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

5.2.3.3.4. Summary

As hypothesized (Hypothesis 2a), for both patients and partners, attachment-anxiety was negatively associated with emotional support and positively related to receipt of negative interactions. In addition, patient attachment-anxiety was negatively related to their satisfaction with support received and positively related to their spouse's (partner's) receipt of negative interactions. When it comes to the relationship between negative interactions and health outcomes, it was shown that participants' receipt of negative interactions was positively related to their psychological distress (partially confirming Hypothesis 4b). Meanwhile, patient satisfaction with support received was negatively related to their psychological distress. Contrary to hypothesis, patient receipt of instrumental support was negatively related to their level of physical health.

As expected (Hypothesis 5), patient support satisfaction and their receipt of negative interactions mediated the relationship between their attachment-anxiety and psychological distress. However, it was only patient receipt of negative interactions which mediated the relationship between their attachment-anxiety and diabetes well-being.

5.3.Longitudinal results

5.3.1. Descriptive analysis

Out of the 70 couples from Time 1, 62 couples completed Time 4 questionnaires, reducing the sample size for the cross-lagged analysis to 62 couples. A comparison of mean scores using t-tests was conducted to examine differences in characteristics of participants who continued until the last time point (n= 62) and those who did not (n = 8). Results showed that participants who dropped out were younger ($t(67) = 2.442$, $p < .05$ for patients, and $t(68) = 2.682$, $p < .05$ for partners) and reported receiving more instrumental support ($t(68) = 2.136$, $p < .05$ for patients, and $t(68) = 3.772$, $p < .05$ for partners) at Time 1. Furthermore, patients who did not complete Time 4 questionnaires reported engaging in more covert support seeking behavior, $t(68) = 2.050$, $p < .05$ (.044); while partners reported receiving more emotional support, $t(68) = 2.556$, $p < .05$.

There were no significant differences between participants who continued and those who did not in terms of physical health, and diabetes well-being, attachment-anxiety, attachment-avoidance, or in the negative interactions received, all p's > .05.

Table 5.11 shows the means and standard deviations for patient and partner variables at Time 1 and Time 4.

Table 5.11: Means and SDs of Time 1 and Time 4 variables

	Time 1				Time 4			
	Patient		Partner		Patient		Partner	
Measures	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Psychological distress	1.52	0.46	1.41	0.34	1.55	0.51	1.49	0.43
Physical health quality of life	3.72	1.03	4.10	0.85	3.67	0.44	4.03	0.93
Diabetes-specific distress	0.79	0.79	NA	NA	0.54	0.58	NA	NA
Diabetes-specific quality of life	3.88	0.83	NA	NA	4.01	0.69	NA	NA
Emotional support received	2.86	0.70	2.86	0.55	3.02	0.65	2.89	0.70
Instrumental support received	2.52	0.62	2.50	0.54	2.75	0.66	2.65	0.74
Negative interactions received	1.47	0.49	1.44	0.44	1.51	0.43	1.54	0.47
Support satisfaction	4.21	0.98	4.11	0.75	4.22	0.88	4.09	0.83

Note: $N = 62$ couples. NA= not applicable.

5.3.2. Bivariate analysis

Shown in Table 5.12 are the correlations between patient variables at study entry (Time 1) and six months after (Time 4); while that of partner variables are shown in Table 5.13. Attachment-anxiety, measured at Time 1 was correlated with health outcome variables at Time 4, namely psychological distress in patients and partners, and diabetes well-being in patients. As expected, all health outcomes at Time 1 were highly correlated with their counterparts at Time 4; this also holds true for all supportive and negative interaction variables.

Table 5.12: Correlations between Time 1 and Time 4 patient variables

Patient Variables at Time 1	Patient Variables at Time 4						
	Psychological distress	Physical health	Diabetes well-being	Emotional SR	Instrumental SR	Satisfaction with SR	Negative IR
Attachment-anxiety	.535***	-.182	-.396***	-.140	.089	-.306*	.227+
Psychological distress	.622***	.127	-.603***	-.256*	-.187	-.388**	.300*
Physical health	-.370**	.553***	.400***	.010	-.080	.048	-.036
Diabetes well-being	-.537***	.168	.786***	.222+	.104	.317*	-.224+
Covert SS	.327**	.040	-.268*	-.321*	-.299*	-.257*	-.285*
Overt SS	-.103	-.169	.070	.311*	.281*	.252*	-.233+
Emotional SR	-.235+	-.137	.189	.666***	.497***	.583***	-.340**
Instrumental SR	-.097	-.195	-.003	.357**	.556***	.344**	-.125
Satisfaction with SR	-.193	-.148	.294*	.565***	.518***	.688***	-.336**
Negative IR	.232	.039	-.336**	-.420***	-.193	-.527***	.715***

Note: $N = 62$ couples. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Table 5.13: Correlations between Time 1 and Time 4 partner variables

Partner Variables at Time 1	Partner Variables at Time 4					
	Psychological distress	Physical health	Emotional SR	Instrumental SR	Satisfaction with SR	Negative IR
Attachment-anxiety	.420***	-.107	-.117	.087	-.245+	.274*
Psychological distress	.404**	-.365**	.160	.173	-.073	.175
Physical health	-.288*	.721***	-.094	-.090	.050	-.244+
Covert SS	.467***	-.183	-.413***	-.170	-.388**	.408***
Overt SS	-.081	.028	.419***	.140	.258*	-.219+
Emotional SR	-.281*	.122	.560***	.250+	.381**	-.352**
Instrumental SR	-.135	.041	.430***	.473***	.241+	-.157
Satisfaction with SR	-.508***	.172	.317*	.139	.460***	-.395**
Negative IR	.534***	-.215+	-.154	.054	-.436***	.673***

Note: $N = 62$ couples. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

5.3.3. Examining change over time: Cross-lagged analysis

Results from the cross-sectional part partially confirmed the current study's hypotheses. However, cross-sectional results are not enough to make conclusions about the causality of variables, thus further analyses were called for. This section examines the predictive value of attachment-anxiety (the independent variable in the cross-sectional part) and support interaction variables (mediating variable in the cross-sectional part). In addition, to test the possibility that the relationships between receipt of supportive and negative interactions and health outcomes were bidirectional (i.e., health outcomes also causing supportive and negative interactions), the possible predictive value of health outcomes (the dependent variable in the cross-sectional part) was also looked into. To this end, path analyses testing change over time and cross-lagged analyses were conducted. Path analyses were used to examine whether attachment anxiety and support seeking behaviour assessed at Time 1 predicted health outcomes assessed at Time 4 (whilst controlling for Time 1 health outcomes) (see Figure 5.6). Cross-lagged analyses were used to examine whether relationships between variables assessed at both time points (health outcomes, receiving social support and negative interactions) were bidirectional. As attachment and support seeking were meant to be measured only once, mediational analysis using longitudinal data could not be performed.

Figure 5.6 and Figure 5.7 show the path analysis models: for attachment-anxiety and for support seeking, respectively. In Figure 5.6, paths *b* and *f* represent the association between actor attachment-anxiety and actor health outcome at Time 4, whilst controlling for Time 1 health outcome (paths *a* and *d*) and the relationship between spouse attachment-anxiety and actor health outcome at Time 4 (paths *c* and *e*). Similarly, paths *g* and *j* in Figure 5.7 represent the association between actor support seeking behaviour (overt and

covert) and actor health outcome at Time 4, whilst controlling for Time 1 health outcomes (paths *a* and *d*) and the relationship between spouse support seeking behaviour and actor health outcome at Time 4 (paths *h* and *i*).

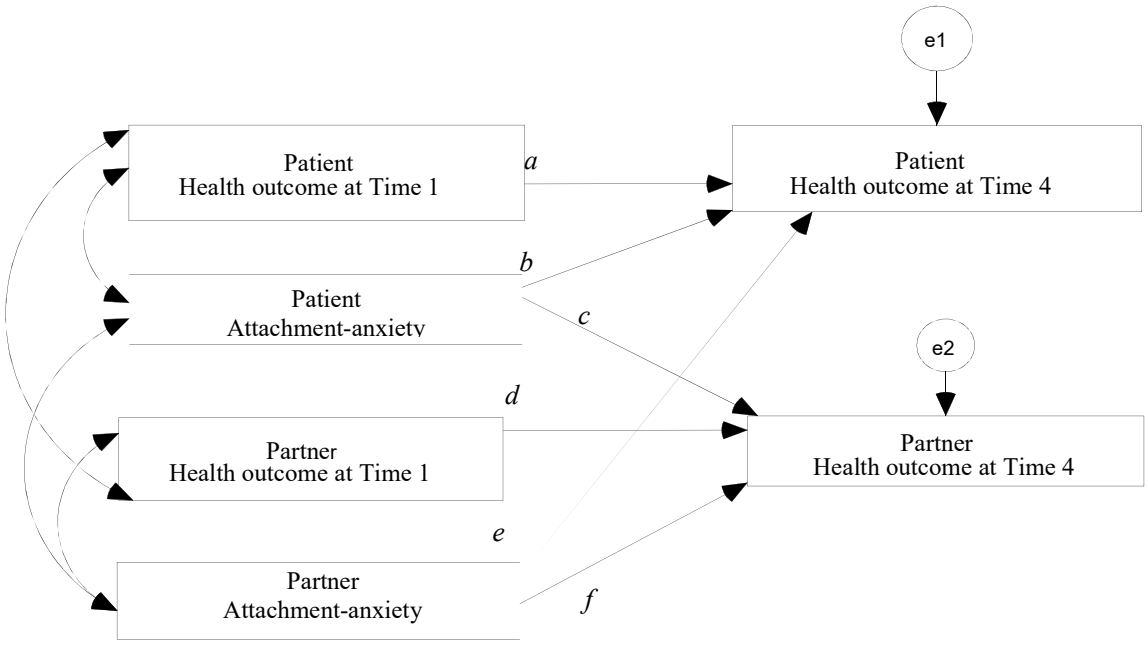


Figure 5.6: Path analysis testing change over time: Attachment-anxiety at Time 1 and health outcomes at Time 4.

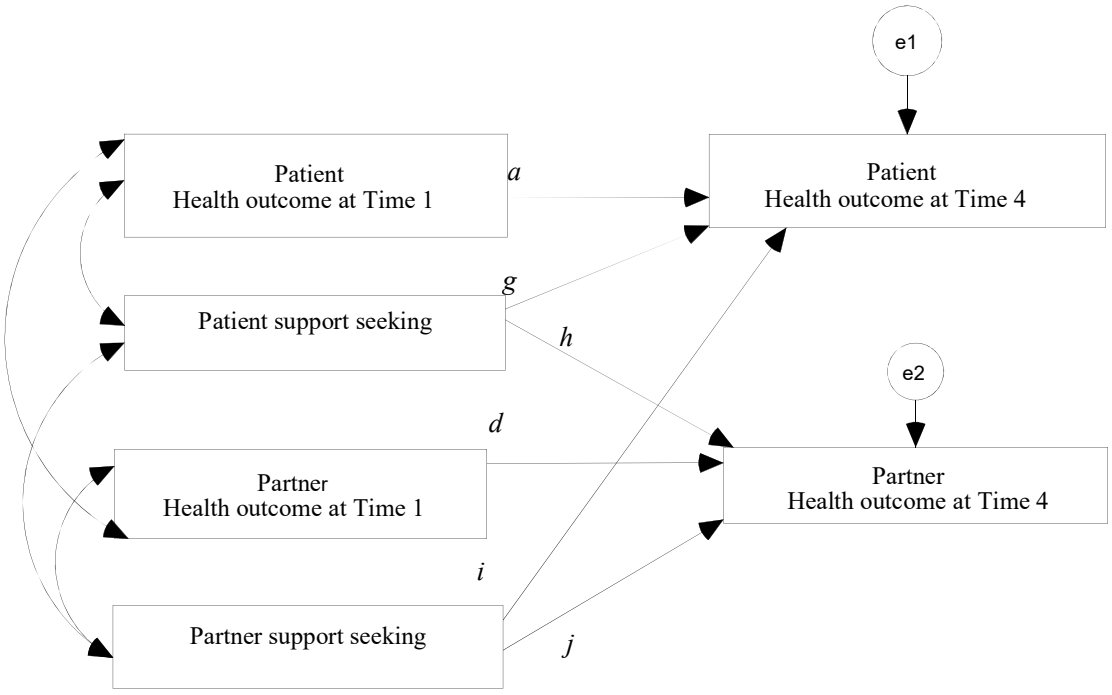


Figure 5.7: Path analysis testing change over time: Support seeking at Time 1 and health outcomes at Time 4.

For the cross-lagged analyses, two models were used per one set of receipt of supportive or negative interaction variable and health outcome variable. The first model, as shown in Figure 5.8, tested actor effects, while Figure 5.9 tested spouse effects. In Figure 5.8, Paths *l* and *n* represent the association between receipt of supportive or negative interaction at Time 1 and health outcome at Time 4, while controlling for Path *p* and Path *r*, respectively. Paths *p* and *r* denote the relationship between health outcome at Time 1 and at Time 4. In the other half of the model, Paths *o* and *q* represent the relationship between actor health outcome at Time 1 and receipt of supportive or negative interaction at Time 4, while controlling for Path *k* and Path *m*, respectively. Paths *k* and *m* represent the relationship between receipt of supportive or negative interaction at Time 1 and at Time 4.

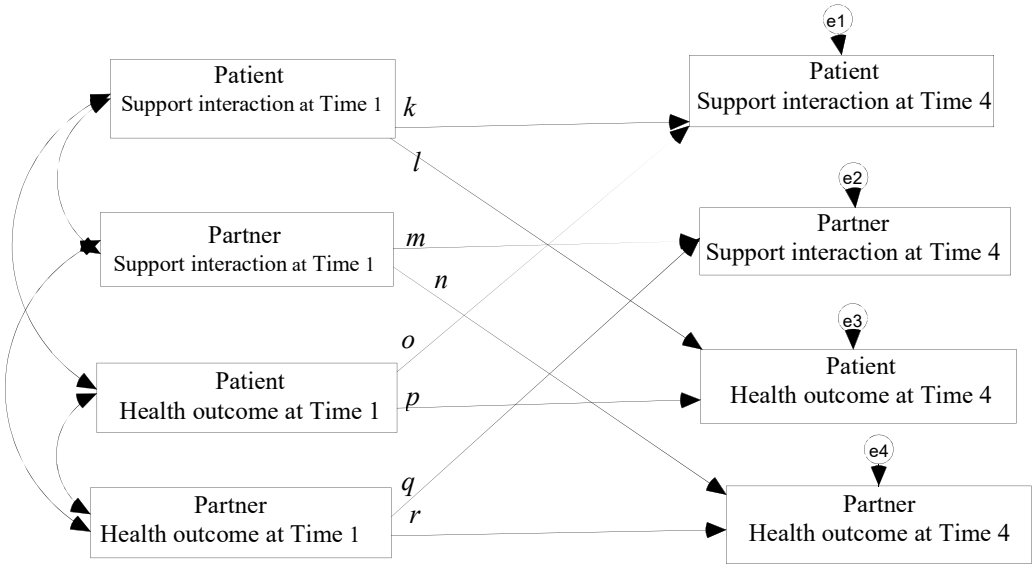


Figure 5.8: Cross-lagged analysis testing actor effects: Receipt of supportive and negative interactions at Time 1 and health outcomes at Time 4.

In Figure 5.9, Path *s* and Path *t* represent the association between actor receipt of supportive or negative interactions at Time 1 and spouse health outcome at Time 4, while controlling for Path *r* and Path *p*, respectively. Path *v* and *u* represent the relationship between actor health outcome at Time 1 and spouse receipt of supportive or negative interactions at Time 4, while controlling for Path *p* and Path *r*, respectively. Paths *k, m, r,* and *p* are the same as that in Figure 5.8.

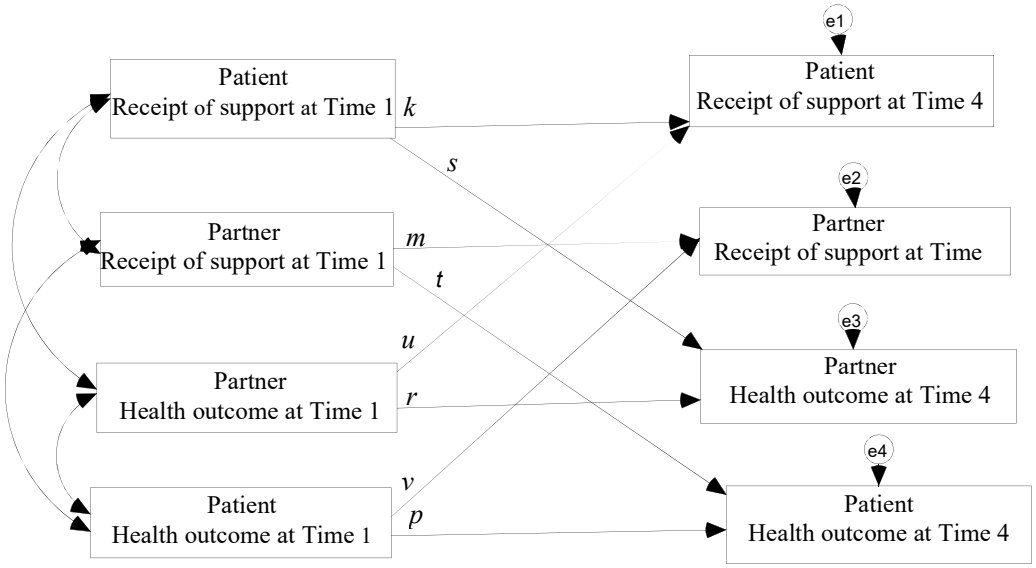


Figure 5.9: Cross-lagged analysis testing spouse effects: Receipt of supportive and negative interactions at Time 1 and health outcome at Time 4.

5.3.3.1.Attachment-anxiety at Time 1 and support interactions at Time 4

The associations between attachment-anxiety and changes over time in supportive and negative interactions were explored. Receipt of instrumental support was the only support variable at Time 4 which was predicted by attachment-anxiety at Time 1. The effect of partner attachment-anxiety at Time 1 on partner receipt of instrumental support at Time 4, while controlling for partner receipt of instrumental support at Time 1, was significant (see Table 5.14). Furthermore, the effect of patient attachment-anxiety at Time 1 on partner receipt of instrumental support at Time 4, while controlling for partner receipt of instrumental support at Time 1, was also significant (see Table 5.14). More anxiously attached partners received more instrumental support from patients over time; whereas more anxiously attached patients had spouses who received less instrumental support over time

(see Table 5.14). Attachment-anxiety did not predict changes in other supportive or negative interactions over time.

5.3.3.2.Attachment-anxiety at Time 1 and health outcomes at Time 4

Path analyses showed that the effect of patient attachment-anxiety on patient psychological distress at Time 4, whilst controlling for patient psychological distress at Time 1, was significant (see Table 5.15, path *b*). Furthermore, the effect of patient attachment-anxiety on partner psychological distress at Time 4, whilst controlling for partner psychological distress at Time 1, was also significant (see Table 5.15, path *c*). These results indicate that patients with higher levels of attachment-anxiety became more psychologically distressed over time. In addition, more anxiously attached patients had a spouse who experienced higher levels of psychological distress over time. However, the attachment-anxiety of partners did not predict their own and the patients' psychological distress. Furthermore, partner and patient attachment-anxiety did not predict patient and partner physical health, and patient diabetes well-being.

Table 5.14: Actor effects and spouse effects of attachment-anxiety at Time 1 on supportive and negative interactions at Time 4 (path analyses)

		Supportive and negative interactions at Time 4							
		Emotional support		Instrumental support		Support satisfaction		Negative interactions	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
Patient	attachment T1 → interaction T4 (path *b*)	.004	.131	.019	.137	-.037	.106	-.118	.114
Partner	attachment T1 → interaction T4 (path *f*)	.110	.117	.365**	.110	-.026	.091	-.035	.121
Spouse effects									
Patient	attachment T1 → interaction T4^{spouse} (path *c*)	-.112	.122	-.358**	.114	-.076	.105	.084	.108
Partner	attachment T1 → interaction T4^{spouse} (path *e*)	.148	.114	.199	.124	-.029	.105	.091	.097

Note: $N = 62$ couples. *SE* = standard error. *** $p < .001$.

Table 5.15: Actor effects and spouse effects of attachment-anxiety at Time 1 on health outcomes at Time 4 (path analyses)

		Health outcomes at Time 4					
		Psychological distress		Physical health		Diabetes well-being	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
Patient	attachment T1 → health outcome T4 (path *b*)	.340*	.120	-.127	.101	-.045	.105
Partner	attachment T1 → health outcome T4 (path *f*)	.139	.113	-.087	.140	NA	NA
Spouse effects							
Patient	attachment T1 → health outcome T4^{spouse} (path *c*)	.324**	.116	.071	.156	NA	NA
Partner	attachment T1 → health outcome T4^{spouse} (path *e*)	-.055	.103	.261 +	.112	-.117	.126

Note: $N = 62$ couples. *SE* = standard error. NA = not applicable. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$.

5.3.3.3.Support seeking at Time 1 and health outcomes at Time 4

Although partner covert support seeking was not significantly correlated with partner psychological distress concurrently (see Section 5.2.3.2.1), it predicted partner psychological distress over time. The effect of partner covert support seeking at Time 1 on partner psychological distress at Time 4, whilst controlling for partner psychological distress at Time 1, was significant (see Table 5.16). Partners who engaged in more covert support seeking at study entry experienced higher levels of psychological distress six months later. However, the effect of patient covert support seeking at Time 1 on patient psychological distress at Time 4, whilst controlling for patient psychological distress at Time 1, was not significant (see Table 5.16). Patient use of covert support seeking did not make a difference to their psychological distress across time even though it was significantly correlated with their psychological distress in the cross sectional part of the study (see Section 5.2.3.2.1). Likewise, results for the effect of actor covert support seeking at Time 1 on actor physical health at Time 4 and diabetes well-being at Time 4, whilst controlling for the said health outcomes at Time 1, were not significant (see Table 5.16). Patient and partner covert support seeking did not predict their own physical health and diabetes well-being. Also, results for the effect of spouse covert support seeking at Time 1 on actor health outcomes at Time 4, whilst controlling for health outcomes at Time 1, were not significant (see Table 5.16). Patient and partner covert support seeking were not related to their spouse's health outcomes across time. In addition, results for the effect of actor and spouse overt support seeking at Time 1 on health outcomes at Time 4 were not significant (see Table 5.16). Patient and partner overt support seeking did not make a different to the changes in their own or to their spouse's health outcomes over time.

Table 5.16: Actor effects and spouse effects of support seeking at Time 1 on health outcomes at Time 4 (path analyses)

		Health outcomes at Time 4					
		Psychological distress		Physical health		Diabetes well-being	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
Patient	covert support seeking T1 → health outcome T4 (path *g*)	.096	.117	.140	.112	.049	.149
	overt support seeking T1 → health outcome T4 (path *g*)	-.059	.129	-.051	.093	.064	.100
Partner	covert support seeking T1 → health outcome T4 (path *j*)	.295*	.137	-.095	.115	NA	NA
	overt support seeking T1 → health outcome T4 (path *j*)	-.136	.125	.107	.174	NA	NA
Spouse effects							
Patient	covert support seeking T1 → health outcome T4 ^{spouse} (path *h*)	.117	.105	-.104	.145	NA	NA
	overt support seeking T1 → health outcome T4 ^{spouse} (path *h*)	.062	.110	-.169	.135	NA	NA
Partner	covert support seeking T1 → health outcome T4 ^{spouse} (path *i*)	.051	.110	.038	.101	-.059	.092
	overt support seeking T1 → health outcome T4 ^{spouse} (path *i*)	.090	.110	.098	.106	.061	.074

Note: $N = 62$ couples. *SE* = standard error. NA = not applicable. $^{*}p < .05$.

5.3.3.4. Supportive and negative interactions and health outcomes

5.3.3.4.1. Support interactions at Time 1 and health outcomes at Time 4

Table 5.17 shows the relationships between receipt of supportive and negative interactions at study entry and health outcomes six months after, whilst controlling for the corresponding health outcome at study entry. Cross-lagged analyses showed that the effects of partner emotional support received and of partner satisfaction with support received at study entry on partner psychological distress at Time 4, whilst controlling for partner psychological distress at Time 1, were significant (see Table 5.17, path *l*). Partners who received more emotional support and who were more satisfied with the support they received at study entry experienced lower psychological distress across time. Likewise, the effects of partner negative interactions received at Time 1 on psychological distress at Time 4, whilst controlling for psychological distress at Time 1, was significant (see Table 5.17, path *l*). Partners who received more negative interactions experienced higher levels of psychological distress over time. In contrast, the effects of patient receipt of supportive and negative interactions at study entry on psychological distress at Time 4, whilst controlling for patient psychological distress at Time 1, was not significant. Patient receipt of supportive and negative interactions at study entry did not predict patient psychological distress six months after even though these variables were significantly correlated in the cross-sectional part (see Section 5.2.3.3.1). Table 5.17 further shows that the supportive and negative interactions received by patients and partners at study entry did not predict their physical health or patient diabetes well-being. When it comes to spouse effect, results showed that the effect of patient receipt of negative interactions at Time 1 on partner psychological distress at Time 4, whilst

controlling for partner psychological distress at Time 1, was significant. Patients who received more negative interactions at study entry had a spouse who experienced higher levels of psychological distress across time. However, partner receipt of supportive and negative interactions did not make a difference to patient psychological distress. Likewise, supportive and negative interactions received by patients and partners at study entry did not predict changes in their spouse's physical health and diabetes well-being across time.

5.3.3.4.2. Health outcomes at Time 1 and support interactions at Time 4

Table 5.18 presents the actor and spouse effects of health outcomes at Time 1 on supportive and negative interactions at Time 4. Patients and partners who experienced higher levels of psychological distress at Time 1 received less negative interactions at Time 4, while controlling for their receipt of negative interactions at Time 1. Psychological distress in patients and partners, therefore, predicted receipt of negative interactions over time. Furthermore, in patients but not in partners, higher psychological distress also predicted their spouse's receipt of more negative interactions over time.

However, psychological distress did not predict changes in receipt of emotional and instrumental support, and support satisfaction. Likewise, physical health in patients and partners, and diabetes well-being in patients, did not predict receipt of supportive and negative interactions.

Table 5.17: Actor effects and spouse effects of supportive and negative interactions at Time 1 on health outcomes at Time 4 (cross-lagged analyses)

		Health outcomes at Time 4					
		Psychological distress		Physical health		Diabetes well-being	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
	(path *l*)						
Patient	emotional support T1 →health outcome T4	-.008	.131	-.092	.083	-.047	.105
	instrumental support T1 → health outcome T4	.022	.108	.024	.106	-.049	.083
	support satisfaction T1 → health outcome T4	.101	.136	-.138	.085	-.011	.119
	negative interactions T1 → health outcome T4	-.090	.128	.169	.095	.039	.122
	(path *m*)						
Partner	emotional support T1 →health outcome T4	-.265*	.127	.096	.143	NA	NA
	instrumental support T1 → health outcome T4	-.141	.107	.074	.134	NA	NA
	support satisfaction T1 → health outcome T4	-.325**	.109	.113	.134	NA	NA
	negative interactions T1 → health outcome T4	.268*	.124	-.167	.112	NA	NA
Spouse effects							
	(path *s*)						
Patient	emotional support T1 →health outcome T4 ^{spouse}	-.148	.148	.033	.129	NA	NA
	instrumental support T1 →health outcome T4^{spouse}	.005	.105	-.056	.156	NA	NA
	support satisfaction T1→health outcome T4 ^{spouse}	-.244	.177	.037	.135	NA	NA
	negative interactions T1 → health outcome T4 ^{spouse}	.306**	.117	-.157^{+}	.094	NA	NA
	(path *t*)						
Partner	emotional support T1 →health outcome T4 ^{spouse}	.091	.127	-.104	.100	.102	.101
	instrumental support T1 →health outcome T4^{spouse}	.086	.121	-.062	.099	.136	.089
	support satisfaction T1→health outcome T4 ^{spouse}	.156	.108	-.019	.098	.038	.100
	negative interactions T1 → health outcome T4 ^{spouse}	-.056	.121	.091	.100	-.032	.111

Note: $N = 62$ couples. *SE* = standard error. NA = not applicable. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$.

Table 5.18: Actor effects and spouse effects of health outcomes at Time 1 on supportive and negative interactions at Time 4 (cross lagged analyses)

		Supportive and negative interactions at Time 4							
		Emotional support		Instrumental support		Support satisfaction		Negative interactions	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
	(path *o*)								
Patient	psych distress T1→ support interaction T4	.032	.087	-.053	.113	.034	.131	-.229*	.082
	physical health T1→ support interaction T4	.010	.089	.091	.118	.028	.100	.100	.080
	diabetes well-being T1→ support interaction T4	.059	.097	.074	.127	.104	.113	.045	.107
	(path *q*)								
Partner	psych distress T1→ support interaction T4	.206+	.094	.166	.107	.111	.099	-.174*	.078
	physical health T1→ support interaction T4	-.087	.093	-.055	.098	-.020	.077	-.133	.083
Spouse effects									
	(path *v*)								
Patient	psych distress T1 → support interaction at $T4^{spouse}$	.122	.112	.010	.140	-.149	.097	.206*	.077
	physical health T1→ support interaction $T4_{spouse}$	.035	.102	-.027	.148	-.006	.081	-.071	.088
	diabetes well-beingT1→ support interaction $T4^{spouse}$	-.070	.115	.006	.142	.116	.119	-.196+	.100
	(path *u*)								
Partner	psych distress T1→ support interaction $T4_{spouse}$	.029	.087	.004	.111	-.060	.095	.045	.090
	physical health T1→ support interaction $T4_{spouse}$	-.098	.075	-.151	.116	-.008	.089	.059	.088

Note: $N = 62$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$.

5.3.3.5. Summary

Aside from being concurrently related to patient psychological distress, patients' attachment-anxiety predicted patient psychological distress level. Patients with higher levels of attachment-anxiety became more psychologically distressed over time. Furthermore, patients who were more anxiously attached had a spouse who experienced higher levels of psychological distress over time. However, patients' attachment-anxiety was not shown to affect patients' diabetes well-being over time even though these two variables were related to each other concurrently.

Attachment-anxiety at study entry was related to affect changes in the amount of instrumental support received over time, despite these two variables being unrelated in the cross-sectional part of the study. That is more anxiously attached partners were shown to receive more instrumental support over time. On the other hand, more anxiously attached patients had a spouse who received less instrumental support over time.

With respect to support seeking and support interaction variables, and health outcomes, partners who engaged in more covert support seeking at Time 1 experienced higher levels of psychological distress over time. On the contrary, partners who received more emotional support, and were more satisfied with the overall support they received, experienced lower psychological distress across time.

Patients and partners who experienced higher levels of psychological distress received less negative interactions over time. Furthermore, partners who received more negative interactions experienced higher psychological distress over time. Patients who experienced higher levels of psychological distress had a spouse who received more negative interactions

over time. Patients who received more negative interactions had a spouse who experienced higher levels of psychological distress across time.

For patients, it was their attachment-anxiety which proved to be a predictor of their level of psychological distress over time. For partners, their spouse's attachment-anxiety, their covert support seeking, their receipt of emotional support, their satisfaction with support received, and the negative interactions they received were shown to predict changes in partners' psychological distress.

6. RESULTS 2

ILLNESS PERCEPTIONS, SPOUSAL SUPPORT AND NEGATIVE INTERACTIONS, AND HEALTH OUTCOMES

This chapter presents the results of the second half of the study which examines: (a) the relationship between illness perceptions and health outcomes; (b) illness perceptions and supportive and negative interactions; and (c) the mediating role of spousal supportive and negative interactions in the relationship between illness perceptions and health outcome. The presentation of results is similar to that of Chapter 5.

6.1.Analysis Overview

In the cross-sectional section results of bivariate analyses and path analyses are presented; while results of cross-lagged analyses are presented in the longitudinal section.

6.2.Cross-sectional results

6.2.1. Descriptive analysis

Means and standard deviations of patients and partners illness perceptions are shown in Table 6.1. Both patients and partners scored above the mid-point of all dimensions of illness perception, except for the timeline cyclical perception. There were no significant differences between patient and partner scores on the following dimensions: timeline cyclical (t (69) = .51, p = .61); consequence (t (69) =.55, p = .58); and treatment control (t (69) =.19, p = .85).

Furthermore, within-couple scores were strongly correlated for timeline cyclical and consequence perception; and moderately correlated for treatment control (see Table 6.2). Generally, both patients and partners agreed that: (1) the patient's diabetes was reasonably predictable (timeline cyclical); (2) the patient's diabetes had a significant consequence on their own and their family's life (consequence); (3) medical treatment could help patients deal with their diabetes better (treatment control**).** However, although within-couple scores on illness coherence and on personal control were correlated (strongly and weakly, respectively), and both patients and partners had relatively high scores on these dimensions; there was a significant difference between patient and partner scores on illness coherence (t (69) =2.05, p =.04) and on personal control (t (69) =2.28, p = .03). Partners, more than patients, were confident that patients had a clear understanding of their illness (illness coherence). On the contrary, patients, more than partners, believed that they exerted a considerable amount of control over their illness (personal control).

The dimensions, within an individual, were correlated with each other. Table 6.2 shows that patient timeline cyclical was positively correlated with consequences and negatively correlated with illness coherence and personal control. Patients who perceived that their diabetes was more unpredictable also recognized that the said illness brought about more consequences. These patients were more likely to have less understanding of their illness and believed that they exerted less control over it. In addition, patient illness coherence was positively correlated with personal control, while consequence was positively correlated with timeline perception. The belief that the patient had a better grasp of his or her diabetes was shown to go with the perception that the patient had more control over the illness. Patients who felt that their diabetes brought more consequences to their life also thought that their illness would last for a longer period of time. Likewise, for partners, illness

coherence was positively correlated with personal control and negatively correlated with consequence (see Table 6.2). Partners who perceived that the patient understood his or her diabetes well, also believed that the patient was in control of his or her illness, and that the patient's illness had fewer consequences. In addition, partners' personal control was positively correlated to timeline.

As expected, personal control was highly correlated with treatment control; this is true for both patients and partners. It appears that participants who believed that the patient could do a lot to avert the negative consequences of the illness also thought that medical treatment was an important part of managing the illness well.

Table 6.1: Means, SDs, and possible range of patient and partner variables

	Patient		Partner			
Measures	*M*	*SD*	*M*	*SD*	Possible Range	Within-couple Correlations
Timeline cyclical	2.83	0.96	2.76	0.93	1 - 5	0.40**
Illness coherence	3.72	0.86	3.91	0.73	1 - 5	0.58**
Consequence	3.24	0.79	3.29	0.72	1 - 5	0.50**
Personal control	4.27	0.66	4.11	0.52	1 - 5	0.27*
Treatment control	3.56	0.64	3.54	0.50	1 - 5	0.34**
Timeline	4.23	0.79			1 - 5	0.53*

Note: $N = 70$ couples. $^{*}p < .05$, $^{**}p < .01$.

6.2.2. Bivariate analysis

Bivariate correlational analyses were conducted to: (1) examine the correlations between (a) illness perceptions and health outcomes (Section 6.2.2.1)) and (b) illness perceptions and social interaction variables (Section 6.2.2.2); and (2) determine (a) which of the illness perceptions would be included as independent variables and (b) which of the social interaction variables would be included as a mediating variable in the mediational analyses (Section 6.2.3).

Table 6.2: Correlations among patient and partner illness perceptions

	Patient Illness perceptions					
Partner	Timeline cyclical	Illness coherence	Consequence	Personal control	Treatment control	Timeline
Timeline cyclical	.402**	-.203	.150	-.364**	-.233	.077
Illness coherence	-.292*.	.578**	.189	.364**	.171	.150
Consequence	.173	.285*	.500**	.012	-.200	.156
Personal control	-.127	.209	.051	.273*	.273*	-.180
Treatment control	-.008	.031	-.318**	.093	.339**	-.265*
Timeline	-.072	.237*	.164	-.023	-.231	.527**

Note: *N=70 couples.* $^{*}p<.05$, $^{**}p<.01$.

6.2.2.1. Illness perceptions and health outcomes

Table 6.3 presents the correlations between patient and partner illness perceptions and their own and their partner health outcome variables. Patients who scored higher on timeline cyclical, and consequences, and lower on illness coherence reported more psychological distress and lower diabetes well-being. Moreover, patients who scored higher on personal and treatment control, and lower on timeline cyclical, and consequence perceptions, reported better physical health. For partners, only a few correlations were significant: Partners who scored higher on timeline cyclical (i.e., felt their spouse's diabetes was more unpredictable), and on consequences (i.e., believed that their spouse's illness had more consequences to their family and personal life) reported higher levels of psychological distress. Furthermore, partners who scored higher on consequences reported lower levels of physical health.

Patients with partners who scored higher on timeline cyclical and lower on illness coherence (see Table 6.3) experienced higher levels of psychological distress. On the other hand, patients with partners who scored higher on illness coherence, and lower on consequence, reported better physical health. Also, patients with partners who scored lower on consequence, and higher on illness coherence, experienced higher levels of diabetes well-being. Meanwhile, patients' illness perceptions were not correlated with partners' psychological distress and physical health.

As the illness perceptions were correlated with each other (see Table 6.2) and those perceptions that were correlated with the health outcomes were generally correlated with the same health outcome (see Table 6.3) (e.g., patient timeline cyclical, illness coherence and consequences were inter-correlated and each of these perceptions were related to patient psychological distress and diabetes well-being), partial correlations were conducted to

determine whether the overlap between the illness perceptions variables warranted including each of them as an independent variable in the subsequent mediation analyses. Table 6.4 presents the partial correlations between the illness perception dimensions and health outcomes.

For patients, only timeline cyclical perception remained significantly correlated with psychological distress and diabetes well-being after controlling for consequences and illness coherence perceptions. After controlling for each of the other illness perception variables (that were also correlated to patient physical health), none of the illness perceptions remained significantly correlated to patient physical health. Finally, none of the patient illness perception variables were significantly correlated with partner psychological distress or partner physical health.

For partners, both timeline cyclical perception and consequences perception remained significantly correlated with their own psychological distress. However, none of the partner illness perception variables remained significantly correlated with patient health outcomes after controlling for other illness perception variables (that were also correlated to patient health outcomes).

Based on these partial correlation analyses, the following illness perception variables were considered as independent variables in the mediational analyses: patient timeline cyclical for models with patient psychological distress or patient diabetes well-being as the dependent variable, partner timeline cyclical perception and partner consequence perception for models with partner psychological distress as the dependent variable, and partner consequence perception for models with partner physical health as the dependent variable.

Table 6.3: Correlations among patient and partner illness perceptions and health outcomes

		Timeline cyclical		Illness coherence		Consequences		Personal control		Treatment control		Timeline	
		Patient	Partner	Patient	Partner	Patient	Partner	Patient	Partner	Patient	Partner	Patient	Partner
Psychological distress	Patient	.425**	.257*	-.252*	-.323**	.241*	.193	-.215	-.086	-.093	.178	-.133	-.083
	Partner	.145	.265*	-.087	-.141	.049	.314**	-.055	-.043	-.148	.087	-.018	-.016
Physical health	Patient	-.245*	-.151	.042	.288*	-.339**	-.252*	.294*	.149	.362**	.232	-.135	-.089
	Partner	-.100	-.209	-.070	.104	-.157	-.242*	.069	.104	.216	.148	.021	-.002
Diabetes well-being	Patient	-.574**	-.082	.468**	.422**	-.330**	-.350**	.138	.083	.019	-.112	.086	.192

Note: $N = 70$ couples. $^{*}p < .05$, $^{**}p < .01$.

Table 6.4: Partial correlations among patient and partner illness perceptions and health outcomes

	Health outcome							
	Patient						Partner	
Illness perception	Psychological distress		Physical health		Diabetes well-being		Psychological distress	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*
Patient								
Timeline cyclical	.283*	.021	.101	.424	-.450**	.000	--	--
Consequence	.114	.363	.206	.099	-.107	.391	--	--
Illness coherence	.018	.883			.189	.128	--	--
Personal control			.068	.591				
Treatment control			.220	.079				
Partner								
Timeline cyclical	.092	.465	--	--	--	--	.237	.050
Illness coherence	-.192	.122	.134	.287	.137	.273		
Consequence			.023	.856	-.144	.249	.292	.015

Note: *N=70 couples.* $^{*}p < .05$, $^{**}p < .01$.

6.2.2.2. Illness perceptions and social interaction variables

Table 6.5 presents the correlations between illness perception variables and social interaction variables. Patients who scored higher on timeline cyclical engaged in more covert support seeking behaviour. Furthermore, patients who scored higher on timeline cyclical, and lower on illness coherence and personal control, reported receiving more negative interactions. There were more significant correlations for partners. Partners who scored higher on timeline cyclical and lower on illness coherence and personal control reported receiving more negative interactions. Partners who scored higher on personal control reported engaging in more overt support seeking behaviour and receiving more emotional support. Furthermore, partners who scored higher on timeline engaged in more covert support seeking behaviour. Patient and partner perceptions about consequences, and treatment control, were not related to any of the patient and partner supportive and negative variables. Likewise, patient time line perception was not associated with any of the patient supportive and negative interaction variables.

Patients with partners who scored higher on timeline cyclical engaged in more covert support seeking. Furthermore, patients with partners who scored higher on treatment control engaged in more covert support seeking and less overt support seeking. Finally, patients with partners who scored higher on illness coherence, and on timeline, received more emotional support. Partners' scores on consequence and on treatment control were not related to any of the patient social interaction variables. Meanwhile, partners with a spouse who scored higher on timeline cyclical engaged in more covert support seeking behavior, and reported more negative interactions; whereas partners with a spouse who scored higher on illness coherence and higher on personal control, reported less negative interactions. Neither patient nor partner

illness perception variables were related to reports of receipt of instrumental support or satisfaction with support received.

As discussed in Section 6.2.2.1, only timeline cyclical and consequences were considered as potential independent variables for the mediation analyses. Both patient timeline cyclical and partner timeline cyclical were correlated with covert support seeking behaviour and receipt of negative interactions. In contrast, neither patient nor partner consequence perceptions were related to support seeking or social interaction variables. Thus, the social interaction variables that were used as mediating variables were covert support seeking and negative interactions for models with timeline cyclical as the independent variable. The reason behind this was that a mediating variable should be correlated with both the independent and dependent variables.

Table 6.5: Correlations among patient and partner illness perceptions and social interaction variables

		Timeline cyclical		Illness coherence		Consequences		Personal control		Treatment control		Timeline	
		Patient	Partner	Patient	Partner	Patient	Partner	Patient	Partner	Patient	Partner	Patient	Partner
Covert SS	Patient	.308**	.246*	-.176	-.008	.118	.146	-.215	.045	-.008	.331**	-.159	-.052
	Partner	.256*	.122	-.067	-.133	.054	.075	.094	-.193	.145	.131	-.151	.321**
Overt SS	Patient	.026	-.024	-.021	-.073	.192	.101	-.058	-.019	.044	-.287**	-.061	-.025
	Partner	.069	.189	-.074	.090	-.018	-.034	-.151	.254*	-.071	.108	-.019	.018
Instrumental SR	Patient	-.136	-.205	.137	.191	-.040	.004	.183	.058	-.033	-.033	-.133	.097
	Partner	.077	.081	-.122	-.014	.059	.165	-.014	.133	.196	.100	-.084	-.105
Emotional SR	Patient	-.165	-.227	.190	.344**	.067	.049	.054	.169	.016	-.108	-.045	.305*
	Partner	-.020	.096	-.095	.072	.131	.092	-.200	.259*	-.087	.040	-.019	.101
Satisfaction with SR	Patient	-.233	-.155	.073	.215	-.031	.080	-.004	.091	-.109	-.187	-.073	-.235
	Partner	-.150	-.132	.015	.119	.196	-.054	.063	-.201	.114	-.009	-.009	.043
Negative Int.	Patient	.349**	.185	-.279*	-.161	.030	-.018	-.240*	-.145	.039	.178	.233	.124
	Partner	.311**	.374**	-.270*	-.315**	-.056	.179	-.252*	-.319**	.059	.145	.283*	.224

Note: $N = 70$ couples. $^{*}p < .05$, $^{**}p < .01$.

6.2.3. Mediational path analysis

The objectives of the mediational analyses conducted in this chapter were to: (1) examine the actor effects of an illness perception dimension on an actor health outcome with social interaction as a mediating variable (see Figure 6.1) ; (2) test the mediating role of a social interaction variable in the relationship between an illness perception dimension and a health outcome (see Figure 6.1 and Figure 6.2); and (3) look at the spouse effects of an illness perception dimension on an actor social interaction variable and on an actor health outcome whilst controlling for actor illness perception (see Figure 6.2 and Figure 6.3) .

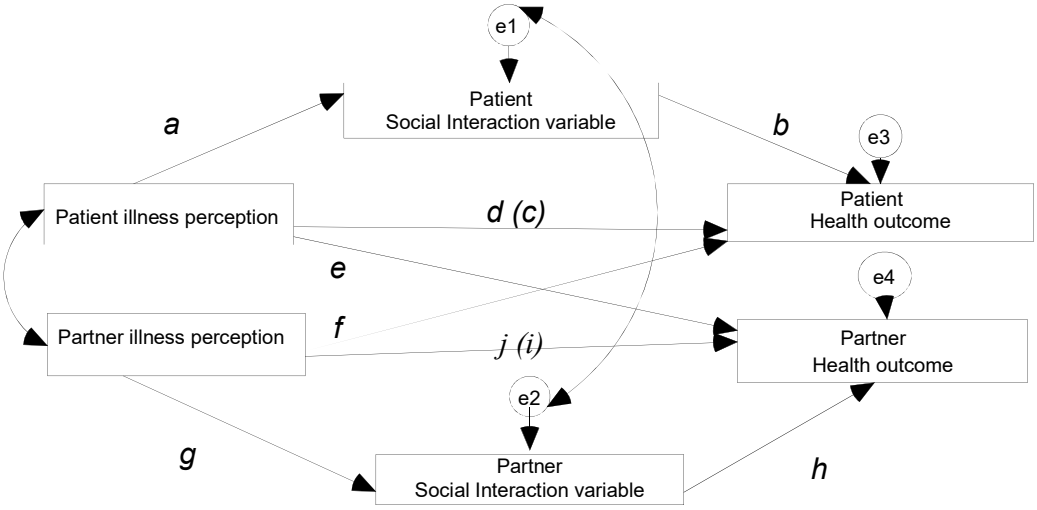


Figure 6.1: Mediational model testing the effect of actor illness perception on actor health outcome with actor social interaction as the mediating variable.

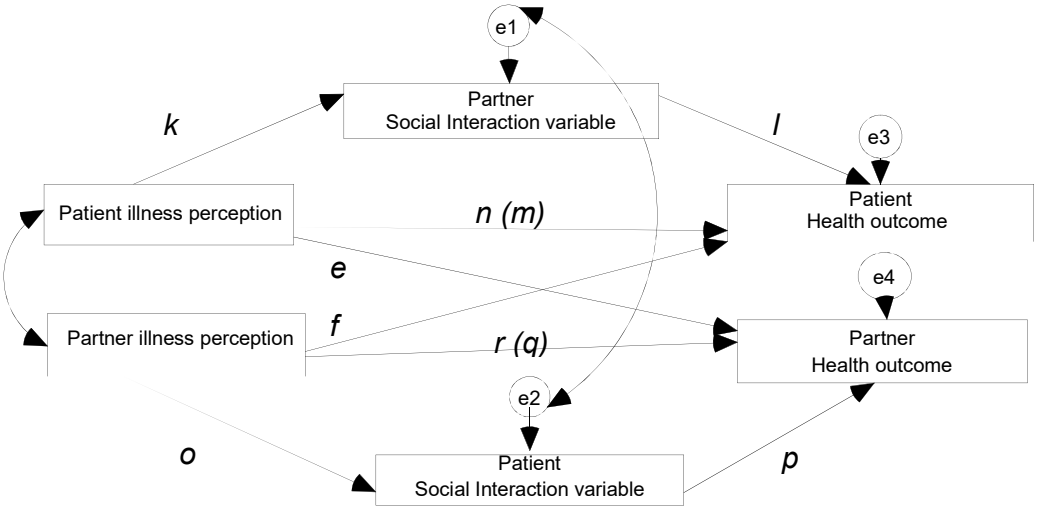


Figure 6.2: Mediational model testing effect of actor illness perception on actor health outcome with spouse social interaction as the mediating variable.

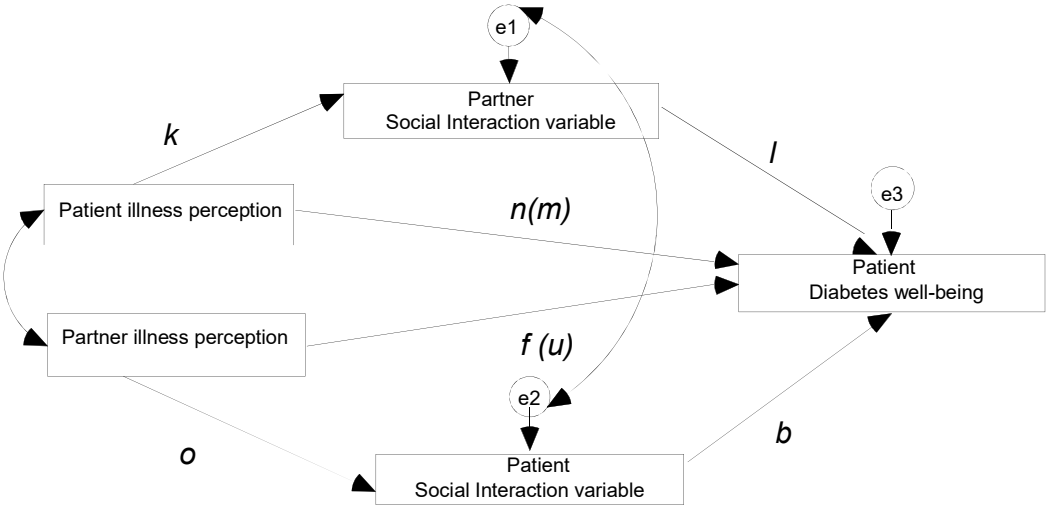


Figure 6.3: Mediational model testing the effect of patient illness perception on patient diabetes well-being with partner social interaction as the mediating variable, and partner illness perception on patient diabetes well-being with patient social interaction as the mediating variable.

6.2.3.1. Illness perceptions, support seeking and health outcomes

6.2.3.1.1. Timeline cyclical, covert support seeking, and psychological distress

Table 6.6 presents actor and spouse effects for the model with timeline cyclical as the independent variable, psychological distress as the dependent variable, and covert support seeking as the mediating variable. The hypothesis (Hypothesis 8a) regarding effect of actor illness perceptions on health outcomes was partially confirmed. The effect of timeline cyclical perception on psychological distress was significant for both patients (*total effect,* path *c*) and partners (*total effect,* path *i*) as shown in Table 6.6. Patients and partners who perceived the diabetes symptoms as being more unpredictable (higher score on timeline cyclical) were more psychologically distressed. However, the hypothesis regarding spouse effects (Hypothesis 8b) were not significant: Patient and partner scores on timeline cyclical were not related to their spouse's psychological distress level.

The expectations that actor (Hypothesis 6a) and spouse (Hypothesis 6b) timeline cyclical perceptions were significantly related to covert support seeking were not supported. In the dyadic mediation analyses, unlike in the bivariate correlations, the relationship between patient timeline cyclical and patient covert support seeking was calculated whilst controlling for partner covert support seeking. As a result, the path between patient timeline cyclical and patient covert-seeking behaviour (path *a*) dropped to non-significance (see Table 6.6). The same was true for spouse effects: patient timeline cyclical was no longer significantly related to partner covert support seeking (path *k*), and partner timeline cyclical was no longer significantly related to patient covert support seeking (path *o*). When it comes to *indirect effects*, the *indirect effect* of timeline cyclical on psychological distress through covert support seeking was significant for patients (see Table 6.6) but not for partners. Thus,

although the path between patient timeline cyclical and patient covert support seeking behaviour dropped to non-significance at the conventional $p < .05$ level (i.e., $p = .076$), a small *indirect effect* was established indicating some, albeit very weak, support for mediation.

Table 6.6: Actor effects and spouse effects of timeline cyclical perception on psychological distress (DV) through covert support seeking behaviour (Mediator)

		Covert Support seeking	
Actor effects		*Beta*	*SE*
Patient	timeline cyclical→ mediator (path *a*)	.267^{+}	.135
	mediator → psych distress (path *b*)	.460**	.112
	timeline cyclical→ psych distress (path *d*)	.277*	.111
	timeline cyclical→ psych distress ^{spouse} (path *e*)	-.020	.132
	timeline cyclical→psych distress(*total effect*, *path c*)	.400**	.117
	timeline cyclical→psych distress (*indirect effect*)	.123*	.071
Partner	timeline cyclical→ mediator (path *g*)	.092	.113
	mediator →psych distress (path *h*)	.268^{+}	.147
	timeline cyclical→psych distress (path *j*)	.243*	.122
	timeline cyclical→psych distress ^{spouse} (path *f*)	.038	.118
	timeline cyclical→psych distress(*total effect,* path *i*)	.268*	.131
	timeline cyclical→psych distress (*indirect effect*)	.025	.033
Spouse effects			
Patient	timeline cyclical → mediator ^{spouse} (path *k*)	.211	.121
	Mediator ^{spouse}→ psych distress (path *l*)	.145	.111
	timeline cyclical → psych distress (path *n*)	.352	.115
	timeline cyclical → psych distress ^{spouse} (path *e*)	.019	.135
	timeline cyclical → psych distress (*total effect*, *path m*)	.382**	.114
	timeline cyclical→ psych distress (*indirect effect*)	.031	.031
Partner	timeline cyclical → mediator ^{spouse} (path *o*)	.238	.125
	mediator^{spouse}→ psych distress (path *p*)	.113	.124
	timeline cyclical → psych distress (path *r*)	.234	.127
	timeline cyclical → psych distress ^{spouse} (path *f*)	.101	.130
	timeline cyclical → psych distress (*total effect,* path *q*)	.261*	.128
	timeline cyclical → psych distress (*indirect effect*)	.027	.038

Note: $N = 70$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$.

6.2.3.1.2. Timeline cyclical, covert support seeking, and diabetes well-being

The actor and spouse effects of timeline cyclical perception on diabetes well-being through covert support seeking behavior are shown in Table 6.7.As expected, both patient and partner timeline cyclical perception were negatively related to patient diabetes well-being (see Table 6.7, *total effect*, *paths c and w* respectively): patients who scored higher on timeline cyclical, and who had a partner who scored higher on timeline cyclical, reported lower levels of diabetes well-being. Even though the path between patient timeline cyclical and patient covert- support seeking behaviour dropped to non-significance at the conventional $p < .05$ level (same with results in Section 6.2.3.1.1) a small *indirect effect* was established indicating some evidence for mediation.

Table 6.7: Actor effects and spouse effects of timeline cyclical perception on diabetes well-being through covert support seeking behaviour (Mediator)

		Covert Support seeking	
Actor effects		*Beta*	*SE*
Patient	timeline cyclical→mediator (path *a*)	.267^{+}	.135
	mediator →diabetes well-being (path *b*)	-.322**	.118
	timeline cyclical →diabetes well-being (path *d*)	-.543**	.105
	timeline cyclical→ diabetes well-being (*total effect*, path *c*)	-.629**	.096
	timeline cyclical →diabetes well-being (*indirect effect*)	-.086*	.057
Partner	timeline cyclical → mediator (path *g*)	.092	.113
	mediator →diabetes well-being (path *v*)	-.126	.088
	timeline cyclical →diabetes well-being ^{spouse} (path *f*)	.230*	.097
	timeline cyclical →diabetes well-being ^{spouse} (*total effect,* path *w*)	.219*	.099
	timeline cyclical → diabetes well-being ^{spouse} (*indirect effect*)	-.012	.018
Spouse effects			
Patient	timeline cyclical →mediator ^{spouse} (path *k*)	.211^{+}	.121
	mediator ^{spouse}→diabetes well-being (path *l*)	-.128	.089
	timeline cyclical →diabetes well-being (path *n*)	-.558**	.106
	timeline cyclical →diabetes well-being (*total effect,* path *m*)	-.585**	.106
	timeline cyclical →diabetes well-being (*indirect effect*)	-.027	.027
Partner	timeline cyclical → mediator ^{spouse} (path *o*)	.238^{+}	.125
	mediator ^{spouse}→diabetes well-being (path *p*)	-.334**	.127
	timeline cyclical →diabetes well-being ^{spouse} (*path f*)	.237*	.100
	timeline cyclical →diabetes well-being (*total effect,* path *u*)	.157	.106
	timeline cyclical → diabetes well-being ^{spouse} (*indirect effect*)	-.079*	.046

Note: $N = 70$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$.

6.2.3.2. Illness perceptions, supportive and negative interactions, and health outcomes

6.2.3.2.1. Timeline cyclical, negative interactions, and psychological distress

Table 6.8 presents actor and spouse effects of timeline cyclical on psychological distress, this time with negative interactions received as the mediating variable. The *total effect* paths between timeline cyclical and psychological distress are the same as in Table 6.6 and have been discussed in Section 6.2.3.1.1. Hypotheses regarding the association between actor (Hypothesis 7a) and spouse (Hypothesis 7b) illness perceptions and receipt of supportive and negative interactions were partially supported. As expected, timeline cyclical perceptions were related to negative interactions. Patients and partners who perceived the diabetes as being more unpredictable, reported receiving more negative interactions from their spouse (see Table 6.8, actor effects paths *a* and *g*). In addition, patients who perceived their diabetes to be more unpredictable had a partner who reported receiving more negative interactions (Table 6.8, path *k*).

Partially confirming Hypothesis 4b, results further showed that patients and partners who reported more negative interactions with their partner also reported higher levels of psychological distress (see Table 6.8, path *b* and path *h*). No spouse effects were found with regard to the relationship between negative interactions and psychological distress (path *l* and path *p*).

The indirect actor effect of actor timeline cyclical perception on psychological distress was significant for both patients and partners (see Table 6.8). Patients and partners who believed that the patient's diabetes was more unpredictable reported receiving more negative interactions, and in turn experienced higher psychological distress. It can be concluded, then, that the participants' timeline cyclical perception worked through their

receipt of negative interactions to influence their psychological distress. Significant *indirect effects* were not found in the spouse models. The negative interactions received by patients and by partners did not mediate the relationship between their spouse's timeline cyclical perception and psychological distress.

Table 6.8: Actor effects and spouse effects of timeline cyclical perception on psychological distress through negative interactions received (Mediator)

		Negative interactions	
Actor effects		*Beta*	*SE*
Patient	timeline cyclical→mediator (path *a*)	.296**	.105
	mediator →psych distress (path *b*)	.510**	.122
	timeline cyclical→psych distress (path *d*)	.222+	.113
	timeline cyclical→psych distress spouse (path *e*)	-.025	.120
	timeline cyclical→psych distress (*total effect,* path *c*)	.373**	.113
	timeline cyclical→psych distress (*indirect effect*)	.151**	.072
Partner	timeline cyclical→mediator (path *g*)	.370**	.088
	mediator →psych distress (path *h*)	.370**	.124
	timeline cyclical→psych distress (path *j*)	.136	.122
	timeline cyclical→psych distress spouse (path *f*)	.078	.119
	timeline cyclical→psych distress (*total effect,* path *i*)	.267*	.125
	timeline cyclical→psych distress (*indirect effect*)	.131**	.054
Spouse effects			
Patient	timeline cyclical→mediator spouse (path *k*)	.216 *	.100
	mediator spouse→psych distress (path *l*)	.069	.158
	timeline cyclical→psych distress (path *n*)	.374**	.120
	timeline cyclical→psych distress spouse (path *e*)	.035	.136
	timeline cyclical→ psych distress (*total effect,* path *m*)	.389**	.114
	timeline cyclical→ psych distress (*indirect effect*)	.015	.038
Partner	timeline cyclical→ mediator spouse (path *o*)	.087	.114
	mediator spouse→psych distress (path *p*)	.035	.154
	timeline cyclical→ psych distress (path *r*)	.247	.127
	timeline cyclical→psych distress spouse (path *f*)	.083	.131
	timeline cyclical→ psych distress (*total effect, path q*)	.250 *	.127
	timeline cyclical→ psych distress (*indirect effect*)	.003	.022

Note: $N = 70$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$.

6.2.3.2.2. Timeline cyclical, negative interactions, and diabetes well-being

Table 6.9 presents the actor and spouse effects of timeline cyclical perception on patient diabetes well-being through receipt of negative interactions. Same as with the results discussed in Section 6.2.3.1.2, patient timeline cyclical perception as well as partner timeline cyclical perception were both correlated with patient diabetes well-being. Furthermore, patient receipt of negative interactions, but not that of partners, was related to patient diabetes well-being (same results as discussed in Section 5.2.3.3.3). In addition, the *indirect effect* of patient timeline cyclical perception on diabetes well-being through receipt of negative interactions was significant (see Table 6.9, *indirect effect*). Therefore, it was established that patient receipt of negative interactions mediated the relationship between patient timeline cyclical perception and patient diabetes well-being. Patients who perceived their diabetes as being more unpredictable received more negative interactions, patients who received more negative interactions, in turn, reported experiencing lower levels of diabetes well-being.

Table 6.9: Actor effects and spouse effects of timeline cyclical perception on diabetes well-being (DV) through negative interactions received (Mediator)

		Negative interactions	
Actor effects		*Beta*	*SE*
Patient	timeline cyclical→mediator (path *a*)	.296**	.105
	mediator →diabetes well-being (path *b*)	-.323*	.140
	timeline cyclical→ diabetes well-being (path *d*)	-.531**	.105
	timeline cyclical→ diabetes well-being (*total effect,* path *c*)	-.627**	.093
	timeline cyclical→ diabetes well-being (*indirect effect*)	-.096*	.058
Partner	timeline cyclical→mediator (path *g*)	.355**	.088
	mediator → diabetes well-being (path *h*)	-.088	.120
	timeline cyclical→ diabetes well-being ^{spouse} (path *f*)	.224*	.108
	timeline cyclical→ diabetes well-being (*total effect,* path *i*)	.193+	.105
	timeline cyclical→ diabetes well-being (*indirect effect*)	-.031	.042
Spouse effects			
Patient	timeline cyclical→mediator ^{spouse} (path *k*)	.216*	.100
	mediator ^{spouse}→ diabetes well-being (path *l*)	-.090	.119
	timeline cyclical→ diabetes well-being (path *n*)	-.550**	.106
	timeline cyclical→ diabetes well-being (*total effect,* path *m*)	-.570**	.106
	timeline cyclical→diabetes well-being (*indirect effect*)	-.019	.030
Partner	timeline cyclical→ mediator ^{spouse} (path *o*)	.087	.114
	mediator ^{spouse}→ diabetes well-being (path *p*)	-.337*	.151
	timeline cyclical→diabetes well-being ^{spouse} (path *r*)	.232*	.110
	timeline cyclical→diabetes well-being (*total effect, path q*)	.203+	.108
	timeline cyclical→ diabetes well-being (*indirect effect*)	-.029	.039

Note: $N = 70$ couples. *SE* = standard error. $^{+}p < .10$, $^{*}p < .05$, $^{**}p < .01$.

6.2.3.2.3. Summary

In the models used in mediational analyses, the only dimension used as an independent variable was timeline cyclical perception; while two variables were used as a mediating variable—support seeking and receipt of negative interactions. As expected (Hypothesis 8a), results showed that for both patients and partners, higher score on timeline cyclical perception meant higher levels of psychological distress. Likewise, for patients, higher score on timeline cyclical perception was related to lower levels of diabetes well-being. Although the relationship between patient timeline cyclical and patient covert support seeking behaviour was only marginally significant, the *indirect effects* of patient timeline cyclical on their psychological distress was significant, thus there appeared to be a weak mediation. With regard to the relationship between timeline cyclical and the other mediating variable, receipt of negative interactions; it was shown patients and partners higher on timeline cyclical received more negative interactions (as expected in Hypothesis 7b). Furthermore, patients higher on timeline cyclical had a partner who also received more negative interactions. In addition, because the negative interactions received by both patients and partners were also related to their psychological distress, and that the *indirect effects* were significant; it has been established that receipt of negative interactions mediated the relationship between timeline cyclical and psychological distress. Also, negative interactions mediated between patients' timeline cyclical perception and their diabetes well-being.

6.3.Longitudinal results

6.3.1. Bivariate analysis

Shown in Table 6.10 are the correlations between patient illness perceptions measured at study entry, and health outcomes and social interaction variables measured six months after. Correlations for partners are shown in Table 6.11. As expected, some dimensions of illness perceptions at Time 1 were still correlated with health outcomes and support interaction variables at Time 4. Patients who, at Time 1, perceived that the symptoms of their illness were unpredictable (higher score on timeline cyclical), who thought that their illness brought about more consequences (higher score on consequence), and who had less understanding of their illness (lower score on illness coherence), experienced higher levels of psychological distress and lower levels of diabetes well-being at Time 4. Patients who perceived their illness as bringing less consequences (lower score on consequences), and who thought that their medical treatment was helping them deal better with their diabetes (higher score on treatment control) at Time 1, reported higher levels of physical health at Time 4. Patients who scored higher on illness coherence at Time 1 reported receiving more emotional and instrumental support at Time 4. Patients who scored higher on timeline cyclical at Time 1 were less satisfied with the support they received at Time 4. Patients who scored higher on timeline at Time 1 received less negative interactions. Meanwhile, partners who believed that the diabetes symptoms were unpredictable (higher score on timeline cyclical), and partners who perceived that the patient exerted less control over the illness (lower score on personal control), experienced higher levels of psychological distress. Partners who believed that the patient's diabetes would last longer (higher score on timeline), who perceived the patient's symptoms to be more unpredictable, and who believed that the patient exerted less control

over the diabetes (lower score on personal control), reported receiving more negative interactions at Time 4. Correlations among partner illness perception variables at Time 1 and patient health outcomes and social interaction variables at Time 4 are shown in Table 6.12. Patients with a partner who scored lower on illness coherence at Time 1, reported higher levels of psychological distress and lower levels of diabetes well-being at Time 4. In contrast, patients with a partner who scored higher on illness coherence at study entry, and lower on consequences, experienced better physical health six months after. Patients with a partner who scored higher on timeline at Time 1 received more emotional and instrumental support, and were more satisfied with the support they received at Time 4. Lastly, patients with a partner who scored higher on personal control at Time 1 received less negative interactions at Time 4. Table 6.13 presents the relationship between patient illness perception at Time 1 and partner health outcomes and social interaction variables at Time 4. Partners who had a spouse who scored higher on timeline cyclical at Time 1 experienced higher psychological distress and received more negative interactions at Time 4. Partners who had a spouse who scored higher on consequence and lower on treatment control at Time 1 received more emotional support.

Table 6.10: Correlations among patient illness perception at Time 1 and patient health outcomes and social interaction variables at Time 4

Patient Illness perception at Time 1	Patient Variables at Time 4						
	Psychological distress	Physical health	Diabetes well-being	Emotional SR	Instrumental SR	Satisfaction with SR	Negative IR
Timeline	-.041	-.035	.054	.027	.005	.133	-.282*
Timeline cyclical	.369**	-.244	-.401**	-.208	.005	-.257*	.184
Illness coherence	-.309*	.141	.431**	.297*	.274*	.140	-.175
Consequence	.315*	-.277*	-.394**	.072	-.032	-.054	-.162
Personal control	-.236	.195	-.201	.000	.117	-.056	-.186
Treatment control	-.140	.268*	.160	-.181	-.054	-.195	-.037

Note: $N = 62$ couples. $^{*}p < .05$, $^{**}p < .01$.

Table 6.11: Correlations among partner illness perception at Time 1 and partner health outcomes and social interaction variables at Time 4

Partner Illness perception at Time 1	Partner Variables at Time 4					
	Psychological distress	Physical health	Emotional SR	Instrumental SR	Satisfaction with SR	Negative IR
Timeline	-.159	.007	.109	.014	.148	-.313*
Timeline cyclical	.274*	-.227	.198	.150	-.164	.293*
Illness coherence	-.230	.071	-.117	-.052	-.004	-.170
Consequence	.224	-.211	.207	.240	.032	.136
Personal control	-.306*	.215	.150	-.117	.249	-.277*
Treatment control	-.105	.165	-.052	-.040	-.050	.064

Note: $N = 62$ couples. $^{*}p < .05$.

Table 6.12: Correlations among partner illness perception at Time 1 and patient health outcomes and social interaction variables at Time 4

Partner Illness perception at Time 1	Patient Variables at Time 4						
	Psychological distress	Physical health	Diabetes well-being	Emotional SR	Instrumental SR	Satisfaction with SR	Negative IR
Timeline	-.033	.109	.167	.333*	.254*	.281*	-.218
Timeline cyclical	.227	-.203	-.150	-.071	-.001	-.039	.237
Illness coherence	-.488**	.344**	.499**	.097	.095	.122	-.075
Consequence	.246	-.336**	-.344	-.010	-.045	-.052	-.089
Personal control	.010	.092	.084	.180	-.037	.140	-.317*
Treatment control	.066	.154	-.068	-.105	-.183	-.116	.040

Note: $N = 62$ couples. $^{*}p < .05$, $^{**}p < .01$.

Table 6.13: Correlations among patient illness perception at Time 1 and partner health outcomes and social interaction variables at Time 4

Patient Illness perception at Time 1	Partner Variables at Time 4					
	Psychological distress	Physical health	Emotional SR	Instrumental SR	Satisfaction with SR	Negative IR
Timeline	-.162	.088	.095	-.028	.156	-.231
Timeline cyclical	.375**	-.115	.001	.043	-.119	.333***
Illness coherence	-.205	.025	-.064	-.028	.137	-.239
Consequence	.125	-.146	.270*	.138	.121	.008
Personal control	-.236	.181	-.170	-.092	.032	-.123
Treatment control	-.168	.239	-.260*	-.086	-.052	.110

Note: $N = 62$ couples. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

6.3.2. Examining change over time: Cross-lagged analysis

This section analyzes the predictive value of illness perception variables (the independent variable in the cross-sectional part)—the effect of illness perception dimensions on changes in health outcomes over time, (Figure 6.4) and the effect of illness perception dimension on changes in support interaction variables over time (Figure 6.5).

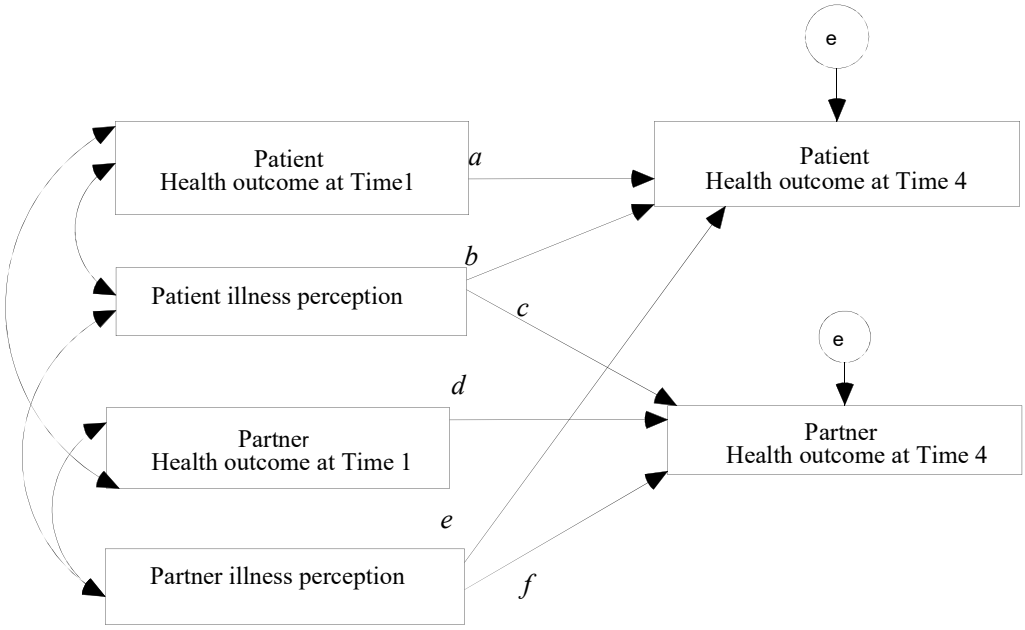


Figure 6.4: Path analysis testing change over time: Illness perception at Time 1 and health outcomes at Time 4.

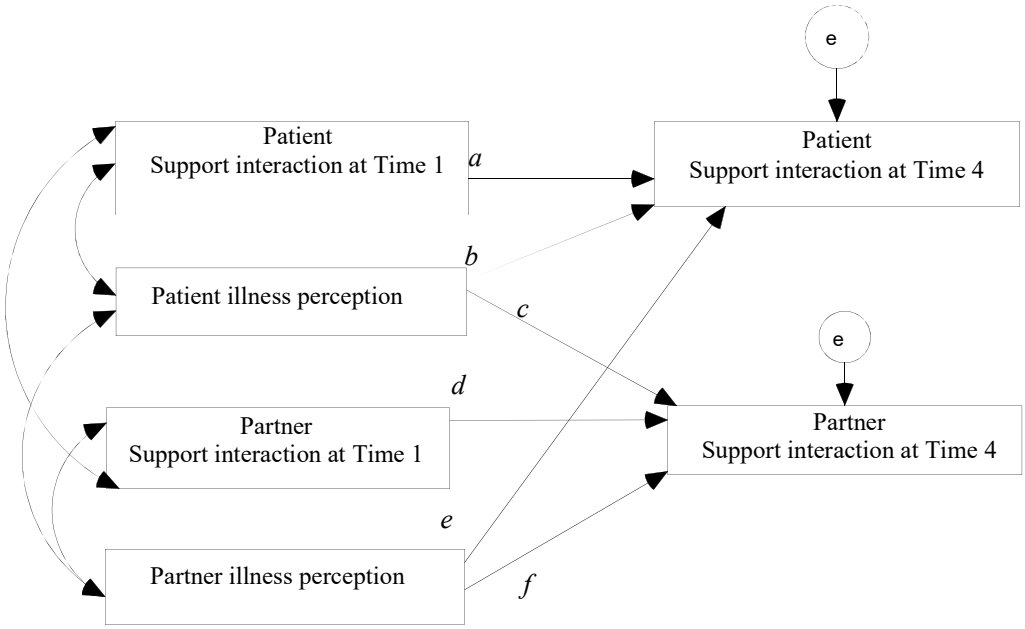


Figure 6.5: Path analysis testing change over time: Illness perception at Time 1 and social interaction variable at Time 4.

6.3.2.1. Illness perceptions at Time 1 and health outcomes at Time 4

Actor and spouse effects of illness perception at Time 1 on health outcomes at Time 4 are shown in Table 6.14. The possibility that illness perceptions would not only be concurrently related to health outcomes but would also predict health outcomes over time (whilst controlling for Time 1 health outcomes) was explored. Although concurrently (both at Time 1 and at Time 4), timeline cyclical, coherence and consequences were all related to patient psychological distress and diabetes well-being, none of these illness perceptions predicted a change in these health outcomes (i.e., none of the actor effects for patients in Table 6.14 were significant). The same was true for the actor effects for partners with one exception: Partners who believed that the patient was in control of the diabetes at study entry experienced a decrease in psychological distress levels six months after. Table 6.14 further shows that only one spouse effect was found: Patients who perceived their diabetes as being more unpredictable at study entry had a partner who experienced increased levels of psychological distress six months after. None of the illness perception variables predicted changes in either physical health or diabetes well-being after controlling for Time 1 health outcomes.

6.3.2.2. Illness perceptions at Time 1 and supportive and negative interactions at Time 4

Table 6.15 presents actor and spouse effects of illness perception measured at study entry on support interaction variables measured six months after. From the cross-sectional study, timeline cyclical perception, for both patients and partners, was positively related to receipt of negative interactions. Furthermore, patient consequence perception was positively related to partner satisfaction with support received (see 6.2.2.2). However, from the longitudinal part results, timeline cyclical perception did not predict negative interactions and

consequence perception did not predict satisfaction with support received (see Table 6.15). The illness perception variables that were found to be predicting support interaction variables were illness coherence and personal control. Patient illness coherence perception at study entry predicted the changes in their receipt of emotional support over time. Patients who perceived themselves as having a better understanding of their diabetes at study entry reported receiving more emotional support six months after. Interestingly, partner illness coherence perception also predicted changes in their spouse's receipt of emotional support over time. However, the effects of patient timeline cyclical perception and partner timeline cyclical perception on patient receipt of emotional support went on different directions. Partner coherence score predicted patient receipt of emotional support. Partners who, at study entry, believed that the patient had a better understanding of the illness had a spouse (patient) who received less emotional support six months after. In addition, partner personal control score predicted patient receipt of negative interactions. Partners who scored higher on personal control had a spouse (patient) who received less negative interactions. Partners who, at Time1, perceived the patient as having more control over the illness had a spouse (patient) who received less negative interactions six months after.

Table 6.14: Actor effects and spouse effects of illness perception at Time 1 on health outcomes at Time 4 (path analyses)

		Health outcomes at Time 4					
		Psychological distress		Physical health		Diabetes well-being	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
Patient	Timeline cyclical→ health outcome T4 (path *b*)	.166	.101	-.023	.109	.149	.116
	Consequence → health outcome T4 (path *b*)	.152	.113	.038	.153	-.122	.078
	Coherence → health outcome T4 (path *b*)	-.029	.144	.035	.120	.013	.144
	Personal control → health outcome T4 (path *b*)	-.151	.110	.042	.113	.067	.106
	Treatment control → health outcome T4 (path *b*)	-.071	.116	.013	.117	.116	.122
Partner	Timeline cyclical → health outcome T4 (path *f*)	.052	.114	-.204^{+}	.113	-.097	.103
	Consequence → health outcome T4 (path *f*)	.057	.151	-.178	.128	.025	.074
	Coherence → health outcome T4 (path *f*)	-.067	.136	.012	.157	.186	.151
	Personal control → health outcome T4 (path *f*)	-.240*	.121	.149	.111	.005	.091
	Treatment control → health outcome T4 (path *b*)	-.129	.119	.063	.120	.074	.122
Spouse effects							
Patient	Timeline cyclical → health outcome T4^{spouse} (path *c*)	.257*	.106	.003	.125	NA	NA
	Consequence → health outcome T4^{spouse} (path *c*)	.056	.138	-.007	.137	NA	NA
	Coherence → health outcome T4 ^{spouse} (path *c*)	-.144	.133	.043	.166	NA	NA
	Personal control → health outcome T4 ^{spouse} (path *c*)	-.107	.147	.143	.149	NA	NA
	Treatment control → health outcome T4 ^{spouse} (path *c*)	-.017	.140	.181	.141	NA	NA
Partner	Timeline cyclical → health outcome T4^{spouse} (path *e*)	.012	.118	-.065	.115	NA	NA
	Consequence → health outcome T4 ^{spouse} (path *e*)	.068	.151	-.150	.148	NA	NA
	Coherence → health outcome T4 ^{spouse} (path *e*)	-.342^{+}	.187	.106	.146	NA	NA
	Personal control → health outcome T4 ^{spouse} (path *e*)	.100	.121	-.200^{+}	.105	NA	NA
	Treatment control → health outcome T4 ^{spouse} (path *e*)	.015	.138	-.018	.092	NA	NA

Note: $N = 62$ couples. *SE* = standard error. NA = not applicable. $^{+}p < .10$, $^{*}p < .05$.

Table 6.15: Actor effects and spouse effects of illness perception at Time 1on supportive and negative interactions at Time 4 (path analyses)

		Supportive and negative interactions at Time 4							
		Emotional support		Instrumental support		Support satisfaction		Negative interactions	
Actor effects		*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*	*Beta*	*SE*
Patient	Timeline cyclical → interaction T4 (path *b*)	-.153	.102	.065	.134	-.186	.117	-.089	.105
	Consequence → interaction T4 (path *b*)	.014	.109	-.050	.123	-.018	.105	-.232^{+}	.139
	Coherence → interaction T4 (path *b*)	.310**	.097	.234^{+}	.105	.178	.127	-.130	.125
	Person control → interaction T4 (path *b*)	-.073	.125	.016	.108	-.076	.131	.047	.109
	Treatment control → interaction T4 (path *b*)	-.182	.104	.032	.105	-.120	.125	-.019	.089
Partner	Timeline cyclical → interaction T4 (path *f*)	.136	.123	.111	.132	-.105	.121	.034	.103
	Consequence → interaction T4 (path *f*)	.094	.117	.176	.120	.017	.120	.032	.106
	Coherence → interaction T4 (path *f*)	-.204	.165	-.088	.216	-.232	.112	.099	.134
	Person control → interaction T4 (path *f*)	.012	.129	-.214	.126	.122	.085	-.088	.102
	Treatment control → interaction T4 (path *f*)	.027	.089	-.005	.120	-.015	.104	-.074	.090
Spouse effects									
Patient	Timeline cyclical → interaction T4^{spouse} (path *c*)	-.050	.117	-.033	.130	.028	.133	.122	.108
	Consequence → interaction T4^{spouse} (path *c*)	.129	.133	.008	.134	.028	.164	.019	.126
	Coherence → interaction T4 ^{spouse} (path *c*)	.072	.147	.048	.183	.249	.189	-.108	.133
	Person control → interaction T4 ^{spouse} (path *c*)	-.058	.124	-.005	.126	-.013	.142	.061	.107
	Treatment control → interaction T4 ^{spouse} (path *c*)	-.180	.106	-.132	.123	-.036	.098	.103	.081
Partner	Timeline cyclical → interaction T4^{spouse} (path *e*)	.138	.114	.058	.125	.144	.113	.118	.100
	Consequence → interaction T4^{spouse} 4 (path *e*)	-.031	.099	-.019	.123	-.085	.118	.030	.107
	Coherence → interaction T4 ^{spouse} (path *e*)	-.339**	.101	-.165	.131	-.118	.112	.110	.108
	Person control → interaction T4 ^{spouse} (path *e*)	.070	.112	-.094	.106	.106	.092	-.237**	.081
	Treatment control → interaction T4 ^{spouse} (path *e*)	.071	.085	-.131	.101	.043	.094	.035	.091

Note: $N = 62$ couples. *SE* = standard error. $^{+}p < .10$, $^{**}p < .01$.

6.3.2.3. Summary

Although both patient and partner dimensions of illness perception were related to health outcomes concurrently, only changes in partner psychological distress over time could be predicted by illness perception. Partner psychological distress was predicted by partner personal control perception and their patient timeline cyclical perception. Meanwhile, with regard illness perception being a predictor of support interaction variable, longitudinal analyses showed that patient and partner illness coherence predicted changes in patient receipt of emotional support over time. Furthermore, partner personal control perception predicted changes in patient receipt of negative interactions over time.

7. DISCUSSION

In the current study, I investigated the effects of two independent variables: working models of attachment and illness perceptions; mediating variables: support seeking and supportive and negative interactions; and health outcomes among patients with type 2 diabetes and their partners.

The major questions of the current study were: (1) Are attachment and illness perceptions related to health outcomes (psychological distress, physical health, and diabetes well-being) in patients with type 2 diabetes and their partners? (2) Do support seeking behaviours and supportive interaction variables mediate the relationship between attachment/illness perception and health outcome? (3) Are there spousal effects?

7.1. Attachment, health outcomes, support seeking behaviour, and supportive interaction variables

In the current thesis, bivariate analyses showed that attachment-anxiety and attachment-avoidance were moderately correlated with each other, and that for patients (but not for partners) both attachment dimensions were correlated with the health outcome variables. Patients who scored higher on attachment-avoidance also scored higher on attachment-anxiety and reported experiencing higher levels of psychological distress, lower levels of physical health and of diabetes well-being. These results concerning the relationship between attachment-avoidance and health outcomes were in accordance with the current study's hypotheses and with the literature. Other studies have shown that patients with diabetes who

scored higher on avoidance had higher HbA1c levels (Ciechanowski et al., 2001 Ciechanowski et al., 2002; Cohen et al., 2005) and an increased duration of the illness (Cohen et al., 2005).

In addition, bivariate analyses revealed that patients and partners who scored higher on attachment-avoidance reported engaging in more covert support seeking behaviour. This was an expected result for, generally, individuals who score higher on attachment-avoidance prefer to stay clear of intimacy with others (Simpson et al., 2002) and prefer relying on themselves more than on others (Bartholomew & Horowitz, 1991). Other studies have shown that that individuals who score higher on avoidance tend to seek less help (Collins & Feeney, 2000; Davila & Kashy, 2009) especially during more stressful conditions (Simpson et al., 1992), and whenever they seek help, they engage in more indirect ways of support seeking(Collins & Feeney, 2000).

Despite the results showing attachment-avoidance being related to health outcomes and to covert support seeking, attachment-avoidance was not included in the mediational and longitudinal analyses. Partial correlation analyses showed that after controlling for attachment-anxiety, the correlations between attachment-avoidance and the health outcomes namely psychological distress and diabetes well-being (which were previously associated with attachment-avoidance) were not significant any more. The mediational and longitudinal analyses of the current thesis, therefore, focused only on attachment-anxiety.

7.1.1. Attachment and health outcomes

7.1.1.1. Cross-sectional and longitudinal analyses

Results of the current thesis showed that patients who scored higher on attachment-anxiety reported experiencing lower levels of psychological well-being, both general and diabetes-specific (but not lower levels of physical health). In addition, longitudinal analyses showed that patient attachment-anxiety predicted changes in patient diabetes well-being over time. These results partially supported evidence from a number of studies showing that attachment-anxiety is related to health outcomes in diabetes patients (Ciechanowski et al., 2002; Cohen et al., 2005).

Interestingly, the findings, in the current thesis, among partners showed a different picture: their ill partners' attachment-anxiety (but not their own) was related to higher levels of psychological distress in partners both concurrently and longitudinally (once their own attachment-anxiety was controlled for). Thus, patients who were more anxiously attached not only reported more psychological distress concurrently and over time themselves, but also had a spouse who experienced higher levels of psychological distress (again, concurrently and over time). This finding illustrates the importance of investigating not only actor effects but of spouse effects as well when examining couples coping with chronic illness. Bowlby (1988) believed that a conflict can either encourage intimacy or aggravate distress, and that the outcome partly depends on the partners' response to the conflict. Studies have shown that individuals who score higher on attachment-anxiety, in general, have a tendency to react more strongly to stressful situations and a tendency to focus on their own issues which may lead them to overlook their partner's needs (Rholes & Simpson, 2004). These behaviours do not facilitate intimacy but more likely will exacerbate distress and other negative feelings.

This is a possible explanation for this thesis' finding that a patient's level of attachment-anxiety is one important factor which may increase the likelihood that his or her partner will have higher levels of psychological distress over time.

7.1.2. Attachment-anxiety, support seeking, and supportive interaction variables

7.1.2.1. Cross sectional analyses

Attachment and support seeking

In line with the hypotheses, the present study showed that patients and partners higher on attachment-anxiety were the ones who reported that they engaged in more covert support seeking. It is not surprising that, in general, more anxiously attached people used more indirect ways of seeking help from their spouse. People higher on attachment-anxiety are more careful not to openly ask for help for fear that their spouse might decline or might not be responsive to this call for support, for when a significant other does not attend to the call, an anxiously attached person would interpret the unresponsiveness as a form of rejection. Thus, instead of risking rejection, these individuals would rather mask their call for help and use covert support seeking strategies. In this way they are not completely helpless while seeking help. They can tell their spouse afterwards that they did not need help after all when, in fact, they did and they did seek help but have done so in an indirect manner. Literature has shown that people's personality traits play a role in their willingness to discuss their problems with and seek help from their spouse. An example would be how people's working models of attachment affect their disclosure and support seeking pattern (Simpson et al., 1992; Ognibene & Collins, 1998).

An interesting finding in the current study was that attachment-anxiety was not only associated with actor covert support seeking, but their spouse's as well. Patients and partners higher on attachment-anxiety had a spouse who engaged in more covert support seeking. Literature has shown that working models of attachment and caregiving are related (Feeney & Hohaus, 2001). Insecure individuals, specifically those with higher attachment-anxiety tend to have more negative views of caregiving compared to secure individuals. Insecure individuals view caregiving as leading to problems that come between them and their partner rather than as a means of being more intimate with their partner (Feeney & Hohaus, 2001). If people higher on attachment-anxiety, in general, are not as efficient in responding to pleas for help (Feeney & Hohaus, 2001), then this could be one of the reasons why their spouse would rather not take a chance at directly asking for help and thus reports using more covert-support seeking behaviours. From various studies, it has been shown that the factors that make support seeking difficult or less effective for persons higher on attachment-anxiety are: sense of trust, view of partner's need for help, and view of caregiving. More secure individuals, compared to insecure individuals, are more capable in seeking help from their partner (Feeney and Hohaus, 2001). Persons who are more anxiously attached have a negative view of other individuals, specifically their attachment figures. They think that attachment figures cannot be relied on during time of duress. Following this kind of thinking, more anxiously attached individuals are not as open as more securely attached individuals in directly expressing their need for help. Thus, they rather mask or disguise their cry for help (Fenney & Hohaus, 2001). It is a different story with secure individuals. Secure individuals do not have any issue with trust. These individuals trust that their attachment figure can be depended on during times of need. They see the attachment figure as unwavering in his or her love and support to his or her partner no matter what the circumstances are. Secure individuals know

that the attachment figure can be depended on to help them get through a distressing situation. Being dependable, the attachment figure is viewed as one who is responsive, easily available, and is not too occupied with other concerns that he or she is always ready to help (Mikulincer, 1998). This is about one's positive expectations of the attachment figure. A number of researches have supported this view (Brennan & Shaver, 1995; Feeney and Noller, 1990; Hazan & Shaver, 1987; Simpson, 1990). Secure individuals have a sense of trust and a positive view of other people which makes them secure enough to take the risk of expressing themselves more to openly seek help from their partner (Mikulincer, 1998). On the contrary, individuals higher on attachment-anxiety may think of instances when their trust on the partner was violated, which then causes them to hold back from seeking help. In a study done by Wickham (2013), insecure participants, compared with secure ones, were found to have lower score in authenticity, which meant that they had less desire for the people close to them to discover an accurate representation of their true self. Furthermore, insecure participants also rated their partner as being less authentic. In addition, insecure participants were shown to have a tendency to focus more on protecting themselves by staying clear of the negative aspects of the relationship rather than on the positive aspects of the relationship.

Attachment and support interaction variables

It was found that, in general, patients and partners higher on attachment-anxiety reported receiving less emotional support from their spouse. Furthermore, patients higher on attachment-anxiety reported being less satisfied with the support they received. These results were in accordance with what could be expected from participants who were less secured with the love, attention, and care given them by their attachment figure, in this case, the

spouse. It could be that subjectively, most of the time they would feel they received less support, specifically emotional support, than what they expected to receive. In a study done by Ognibene and Collins (1998), it was found that participants who were more secure reported more perceived social support from their family and friends.

It was also found in the current study that patients and partners higher on attachment-anxiety reported receiving more negative interactions and being less satisfied with the support they received. In general, people who score higher on attachment-anxiety tend to be more mindful of their spouse's behaviour which may be construed as a threat to their relationship. A negative comment from a spouse may be blown out of proportion and negative behaviours from the partner are highlighted. People who score higher on attachment-anxiety more easily ascribe negative intentions and negative partner's attributes to partner's deeds that may not have met their standards or may not have satisfied them. Furthermore, they more easily doubt their partner's love and intentions. They give more weight to the negative interactions initiated by their partner more than they give to the supportive interactions their partner initiate (Campbell et al., 2005). For example, Campbell et al. (2005) found that persons higher on attachment-anxiety reported conflicts with their partners were inflated and that they were more affected by these conflicts. Furthermore, people higher on attachment-anxiety believed that these conflicts would cause more problems to their relationship. In addition, for these individuals, supportive interactions with their spouse did not ease the negative effects of conflict (Campbell et al., 2005).

Another possibility is that patients who scored higher on attachment-anxiety indeed, objectively, received less emotional support and more negative interactions. Individuals higher on attachment-anxiety have a greater longing for their love to be reciprocated (Hazan & Shaver, 1987) which may lead them to be more dependent (Feeney and Noller, 1990) on

and demanding of their spouse's love and attention. It could be that the more demanding anxiously attached individuals get, the more they push their spouse to the opposite direction—to that of providing less instead of more emotional support. In addition, being demanding may lead the spouse to harbor more ill feelings towards the one being demanding. Thus, there would be more exchanges of negative interactions between the couple.

7.1.2.2. Longitudinal analyses

The longitudinal part of the study suggested that attachment-anxiety predicted receipt of instrumental support. Partners higher on attachment-anxiety reported receiving more instrumental support six months after. Meanwhile, patients higher on attachment-anxiety had a partner who reported receiving less instrumental support six months after. These results were not evident in the cross-sectional part. This may be because it takes some time before the effects of partner attachment-anxiety on their receipt of support, and that of patient attachment-anxiety on their partner's receipt of support can be observed.

The result that partner attachment-anxiety predicted partner receipt of instrumental support over time was against the hypothesis that individuals higher on attachment-anxiety should report receiving less instrumental support. What might have happened was that partners, in general, were not expecting much support, especially instrumental support, from the patients.. But then patients might have provided more than what partners expected to receive from them, thus this registered to the partners as receiving more support. However, partners higher on attachment-anxiety might have noted receiving only more instrumental support and not more emotional support. Meanwhile, the result that patient attachment-anxiety predicted partner receipt of instrumental support over time was in accordance with the hypothesis that spouse of individuals higher on attachment-anxiety should receive less

instrumental support. Individuals higher on attachment-anxiety are found to be less efficient in providing support compared to individuals lower on attachment-anxiety (Carpenter, 2001; Collins & Feeney, 2000; Feeney & Collins, 2001; Simpson et al., 2002).

Attachment-anxiety did not predict the other support interaction variables. It is possible that six months were not enough to observe changes in support interaction variables as influenced by attachment-anxiety.

7.1.3. Mediation

In line with the current thesis' hypotheses, mediational analyses have shown a number of interesting significant relationships. First, results reflect the relationship some paths between attachment-anxiety and support seeking behaviour, and attachment-anxiety and supportive and negative interactions were significant. Patients and partners who scored higher on attachment-anxiety reported engaging in more covert support seeking behaviour, receiving less emotional support but more negative interactions. In addition, patients, but not partners, who scored higher on attachment-anxiety also reported being more satisfied with the support they received. For spouse effects, actor attachment-anxiety was shown to be related to spouse support seeking. Patients and partners who scored higher on attachment-anxiety had a spouse who reported engaging in more covert support seeking behaviour. Moreover, for patients, actor attachment-anxiety was related to spouse receipt of negative interactions. Patients who scored higher on attachment-anxiety had a spouse who reported receiving more negative interactions. Second, there were some paths significant relationships between attachment-anxiety and health outcomes for patients, but not for partners were significant. Patients who scored higher on attachment-anxiety reported experiencing higher levels of psychological distress and lower levels of diabetes well-being. Third, some paths between support seeking

and health outcomes, and support interaction variables and health outcomes were also significant. Patients who engaged in more covert support seeking behaviour and who received more negative interactions reported experiencing higher levels of psychological distress and lower levels of diabetes well-being. Moreover, patients who reported being more satisfied with the support they received reported experiencing higher levels of psychological distress; while patients who reported receiving more instrumental support reported lower levels of physical health. In addition, partners who reported receiving more negative interactions also reported experiencing higher levels of psychological distress. For partners, actor support interaction variable was related to spouse health outcome. Partners who were shown to receive more negative interactions were more likely to have spouses who reported experiencing lower levels of diabetes well-being. Fourth, some *indirect effects* were significant, specifically those of: for patients, attachment-anxiety on psychological distress through covert support seeking and through receipt of negative interactions, attachment-anxiety on psychological distress through satisfaction with support received; for partners, attachment-anxiety on psychological distress through receipt of negative interactions.

These results partially support the hypothesis that support seeking behaviour and supportive and negative interactions mediate the relationship between attachment variables,-anxiety and health outcomes. For patients, covert support seeking behaviour, satisfaction with support received, and negative interactions mediated the relationship between attachment-anxiety and psychological distress. Furthermore, covert support seeking behaviour and negative interactions mediated the relationship between attachment-anxiety and diabetes well-being. However, there was no such mediation for partners. It is important to note that, in the mediational analyses, partner attachment-anxiety was not related to partner psychological

distress. A significant relationship between attachment-anxiety (independent variable) and health outcome (dependent variable) is one of the requirements of mediation.

In summary, results have shown that it is not only one's attachment-anxiety which is related to one's health outcome, specifically psychological well-being, but that a patient's attachment-anxiety is also related to his or her spouse's psychological distress. Also, results demonstrate that attachment-anxiety is related to covert support seeking behaviour and receipt of supportive and negative interactions. Finally, results demonstrate that for patients, attachment-anxiety work through covert support seeking, satisfaction with support received, and receipt of negative interactions to be related to psychological well-being.

7.2. Illness perceptions, health outcomes, support seeking behaviour and support interaction variables

The second part of this thesis focused on illness perceptions. In line with other research (see meta-analysis by Hagger & Orbell, 2003), the current study found that the dimensions of illness perceptions were correlated with each other in such a way that together they formed a coherent representation of the illness. As expected, dimensions which reflect a more positive view about the illness were correlated with each other. In the same manner, dimensions which reflect a more negative view of the illness were also correlated to each other. Specifically, patients who believed that their diabetes symptoms were highly unpredictable (higher score on timeline cyclical) were also the ones who had limited knowledge and understanding of their illness (lower score on illness coherence); they also reported that their illness had affected their personal and family life in significant ways (higher score on consequence), and they believed that they could do little to control their illness (lower score

on personal control). In addition, patients who believed that the illness brought about more consequences, also thought that the illness would last for a longer period of time (higher score on timeline). In a similar vein, partners who perceived the patient as having a good understanding of the illness also thought of the patient as exerting good control over the illness, and believed that the illness did not have too much an effect on the patient's personal and family life.

Within couples, illness perceptions were moderately to strongly correlated and apart from small differences between patients and partners on illness coherence (partners scored higher on coherence compared to patients) and personal control (patients felt they were more in control than partners thought they were), no mean differences were found. This means that on average patients and partners had a fairly similar view of the patient's condition.

7.2.1. Illness perceptions and health outcomes

7.2.1.1. Cross-sectional analyses and longitudinal analyses

In the bivariate analyses, hypotheses with regard to the relationship between patient illness perceptions and health outcomes were partially confirmed. It was shown that, among patients, having a more negative representation of the illness was related to lower levels of psychological well-being, both general and diabetes specific, and to lower levels of physical health.

Specifically, patients who perceived their diabetes symptoms as unpredictable (higher score on timeline cyclical), those who believed that their diabetes had significant consequences, and those who had less understanding of their illness (lower illness coherence) reported experiencing higher levels of psychological distress and lower levels of diabetes

well-being. These findings are in line with previous research. Ample research has shown that patients who perceive their illness as having significant life consequences are more likely to experience higher levels of anxiety and depression (Edwards et al., 2001; Evans & Norman, 2009; Foxwell et al., 2013; Paschalides et al., 2004), and lower levels of quality of life (Foxwell et al., 2013). Furthermore, patients with type 2 diabetes who score lower on illness coherence and who score higher on timeline cyclical perceptions tend to experience higher levels of diabetes-related distress (Paddison et al., 2010).

In the current study, patients who perceived they had more control over their diabetes, who believed that their medical treatment was helping in managing their illness, who perceived their symptoms as being less unpredictable, and who perceived their diabetes as having less consequences reported experiencing better physical health. In other studies, patient illness perceptions have also been found to be related to physical health,: patients who scored higher on personal control (Hagger & Orbell, 2003; Hampson et al., 2000; Heijmans, 1998) , who scored lower on consequences (Heijmans,1998; Paschalides, 2004) also experienced better physical health (Heijmans, 1998; Paschalides, 2004), had more vitality (Hagger & Orbell, 2003; Heijmans, 1998), and had better glucose control (Hampson et al., 2000).One possible reason why personal control and treatment control are related to physical health is that the belief that one can do something to effectively manage one's illness so as to abate its negative effects may motivate them to actively seek ways to make their condition better.

While other studies examining the relationship between illness perceptions and health outcomes have focused mainly on patients, the current study extended previous research by examining the relationship between partner illness perceptions and partner health outcomes. Bivariate analyses have shown that similar to patients, partners' negative representation of

the patient's illness was related to their psychological well-being and physical health. Only three relationships were significant for partners. Partners who scored higher on timeline cyclical and on consequences experienced higher levels of psychological distress. Partners who scored higher on consequences reported experiencing lower levels of physical health. Furthermore, longitudinal analyses have revealed that partner personal control predicted partner psychological distress. Partners who scored lower on personal control perception at Time 1 experienced higher levels of psychological distress six months after, compared to partners who scored lower on personal control. These results provide evidence for the hypothesis that the way partners view their spouse's illness has a significant contribution to partner health outcomes, particularly psychological well-being. Furthermore, these results may reflect the possible ways through which the patient's illness impact the partner's health and the fact that partners are equally, if not more, affected by the patient's illness. To my knowledge this is the first study that has examined the relation between illness perceptions of the partner and health outcomes of the partner. It is valuable to know that partners' views with regard their spouses' illness are related to their own health outcomes. This knowledge will help health practitioners plan and design intervention programs modifying (or making sure that the illness perceptions are well-guided and well-informed) not only patient illness perceptions but partner illness perceptions as well.

The current study also looked into spouse effects, that is, the relationship between patient illness perceptions and partner health outcomes, and partner illness perceptions and patient health outcomes. It was found, in bivariate analyses, that partner timeline cyclical and illness coherence perceptions were both related to patient psychological distress; while partner consequences and illness coherence perceptions were related to patient diabetes well-being. Thus, patients with a partner who scored higher on timeline cyclical perception, and

lower on illness coherence perception, reported experiencing higher levels of psychological distress. Patients with a partner who scored higher on illness coherence perception, and scored lower on consequence perception, reported experiencing better physical health. However, patient illness perceptions were not related to partner health outcomes. In addition, a spouse effect was also shown in the longitudinal analyses: patient timeline cyclical perception predicted partner psychological partner psychological distress. Partners with a spouse who scored higher on timeline cyclical perception at study entry experienced higher levels of psychological distress six months after, compared to partners with a spouse who scored lower on timeline cyclical perception. However, results have not shown illness perceptions predicting patient health outcomes.

As shown in the longitudinal analyses, for both actor and spouse effects, it was partner psychological well-being which was predicted by partner and patient illness perception. One possible reason for this was that partners, more than patients, were affected by their own and their spouse's illness perceptions in the long term. For example, it could be that partners who perceived their spouse with diabetes as not having control over the illness could feel the burden over time. In addition, it is possible that patients whose diabetes symptoms were not as predictable as other patients' symptoms interacted with their partners more negatively on a daily basis, and these negative interactions led to the partners having higher levels of psychological distress. On the other hand, it could also be that patient health outcomes were fairly stable, or that patient and partner illness perceptions had already influenced patient health outcomes a few years after being diagnosed, and that during the study, patient health outcomes had already reached a plateau.

In the current thesis, as mentioned earlier, since illness perception dimensions were correlated with each other, partial correlation analyses were conducted to test which among

the dimensions remain significant even after controlling for other dimensions. Timeline cyclical perception was shown to have the strongest association (and was also the only illness perception dimension which was included in the mediation analyses) to psychological well-being for both patients and partners, and to diabetes well-being for patients. Timeline cyclical perception reflects the uncertainty and unpredictability as to when diabetes symptoms will come and for how long they will linger, and this may be one of the things about the illness that is most difficult to come to terms with. Patients who perceive their diabetes symptoms as being unpredictable may have a more difficult time adjusting, especially psychologically, to the illness compared to patients who think that their symptoms are reasonably predictable. It is an important finding to the current research that the seeming unpredictability of the patient's diabetes symptoms was one of the factors associated with the psychological distress of partners.

7.2.2. Illness perceptions, support seeking, and supportive interaction variables

7.2.2.1. Cross-sectional and longitudinal analyses

Bivariate analyses showed that illness perceptions, as expected, were related to support seeking and variables. Patients who perceived that their diabetes symptoms were unpredictable engaged in more covert support seeking. This finding perhaps seems counter-intuitive at first glance. It might be expected that patients who are bothered by the unpredictability of their symptoms would use direct means of seeking help from their spouse; however this was not the case. The reason for this may be that these patients are unsure as to what kind of help they need and what kind of support they want to ask from their partner. The symptoms these patients are experiencing come and go making it difficult to determine the

help and support one needs. For partners, as hypothesized, a higher score on personal control perception was related to more overt support seeing behaviour; while a higher score on timeline perception was related to more covert support seeking behaviour. The possible reason for this relationship is that partners who think that patients are in control of their illness also think that these patients are more capable of providing them with support when the need arises; thus partners are more confident to directly ask support from them. This explanation is further supported by the result that partners who scored higher on personal control perception also reported receiving more emotional support. In contrast, one possible explanation for the positive relationship between timeline perception and covert support seeking may be that partners who believe that the patients' diabetes is chronic (as compared to those who believe that the patients' diabetes lasts for a short time) may also think that it is more difficult for these patients to provide support; thus partners engage in more indirect ways of asking for support.

Furthermore bivariate analyses revealed that patients and partners who had a more negative representation of the illness, specifically those who had higher timeline cyclical, lower illness coherence, and lower personal control perceptions, reported receiving more negative interactions. These results were in line with the study done by Benyamini et al. (2007) which showed that partners who had a more negative perception of the illness reported providing more negative interactions.

Regarding spouse effects, results revealed that patients were more likely to receive emotional support when their partners scored higher on illness coherence perception and on timeline perception. It might be that a partner who believed that the patient had a good understanding of diabetes also believed that the patient was doing well in coping with the illness, thus the partner was encouraged to provide more emotional support to the patient.

Furthermore, it might also be that a partner who believed that the patient's diabetes would last longer also believed that the patient needed more emotional support.

Results of the longitudinal analyses showed that patients' more positive representation of the illness, specifically that of higher illness coherence, predicted patient receipt of more emotional support over time. However, partners' more positive representation of the illness, specifically that of higher illness coherence, predicted patient receipt of less emotional support. Why was there a difference between the results for patient actor effect and partner spouse effect with regard the relationship between illness coherence and receipt of emotional support over time? Patients who perceived that they had a better understanding of their illness also reported receiving more emotional support over time. In contrast, partners who perceived that patients had a better understanding of their illness also reported receiving less emotional support over time. One possible explanation for this difference in directions of the relationship between illness coherence perception and receipt of emotional support over time is that patients who generally have a more positive view of their illness may also have a relatively more positive view of the support they are receiving from their partner. With regard to partner views of the illness and their relationship to patient receipt of support, what might happen is that as partners perceive that the patient has a better comprehension of the illness, these partners become a bit more lax in providing emotional support. This result was the same as that shown in a cross-sectional study conducted by Benyamini et al. (2007). They found that when partners of patients with diabetes (in comparison with the diabetes patients), had more negative illness perceptions (specifically, they perceived that the patient was experiencing more symptoms and that the diabetes were bringing more consequences), these partners provided more support to the patient.

Furthermore, it was also found that partners' more positive representation of the illness specifically that of higher personal control, predicted patient receipt of less negative interactions. As partners perceived that the patient exerted more control over their illness, this patient reported receiving less negative interactions over time. Partners who believed that the patient was doing his or her best to effectively manage the illness might have wanted to reinforce this behaviour by initiating less negative interactions.

7.2.3. Mediation

Among the support and interaction variables, covert support seeking, and receipt of negative interactions were used as mediating variables in the mediation analyses because they were found to be related to timeline cyclical (which was chosen as the independent variable, through partial correlation analyses).

In the mediation analyses, unlike in the bivariate analyses, patient and partner timeline cyclical was no longer related to covert support seeking when spouse covert support seeking was controlled for. This may mean that partner timeline cyclical perception also partly accounted for patient covert support seeking, thus controlling for partner timeline cyclical perception left the relationship between patient timeline cyclical and covert support seeking insignificant. Thus, covert-support seeking did not mediate the relationship between timeline cyclical perceptions and health outcomes.

With regard to illness perception and support interaction variables, hypotheses were partially confirmed. Patient and partner timeline cyclical perception was related to their own and their partner's receipt of negative interactions. Furthermore, receipt of negative interactions was shown to mediate the relationship between actor timeline cyclical and actor psychological distress. In addition, patient negative interactions mediated the relationship

patient timeline cyclical and diabetes well-being. Patients and partners who scored higher on timeline cyclical perception received more negative interactions from their spouse, which in turn was related to their psychological distress. Furthermore, patients who scored higher on timeline cyclical perception, received more negative interactions, and experienced lower levels of diabetes well-being. Uncertainty brings negative emotions. These negative feelings, in turn, may be the catalyst for the patients to initiate negative interactions (note: results show that patient timeline cyclical perception was correlated with their partner receipt of negative interactions). The partner may then answer back with a negative behaviour and it can become cyclical.

Results of the current thesis support the hypothesis that patients' as well as partners' beliefs regarding the patients' illness are related to their health outcomes, particularly their psychological well-being. In general, positive illness perceptions are related to better psychological well-being. Furthermore, illness perceptions have been shown to be associated with both support seeking behaviour, and receipt of supportive and negative interactions. Finally, results illustrate that for patients as well as for partners, illness perceptions, specifically timeline cyclical perception, work through receipt of negative interactions to be related to psychological well-being.

7.3.Strengths and limitations

7.3.1. Strengths

One of the strengths of this thesis is that data were taken from both patients and partners. Other researchers have suggested the value of using dyadic data to have a better understanding of how interpersonal processes in the context of romantic relationship work to exert its influence on the couple's health outcomes (e.g., Pietromonaco, Uchino, & Schetter, 2013). Using dyadic data avoids a particular blind spot, a view which is not usually considered when looking at the experience of patients in dealing with their illness. That blind spot is the interaction of patient with the partner, which includes partner personality traits and behaviour that influence the said interaction. One of the advantages of having dyadic data is that there is a clearer view of what is going on with the partners as they journey with the patient in experiencing the illness. Results of this thesis and their implication have proven the importance of using dyadic data. Through the use of dyadic data, both actor and spouse effects were examined. The examination of dyadic data has resulted, for example, to the findings that patient attachment-anxiety was related to spouse psychological distress even if partner attachment-anxiety was not related to their own psychological distress. Significant spouse effects would not have been found had dyadic data not been used.

Another strong point of this thesis is that both cross-sectional and longitudinal analyses were conducted. This way, I was able to examine not only correlational relationships, but I was also able to make predictions regarding changes in the variables over time. This is important because there were relationships that appeared to be bidirectional and needed to be examined much more closely. As an example, negative interactions were shown, in the cross-sectional analyses, to be related to psychological distress. By relying only on

cross-sectional analyses, it was not clear whether it was the receipt of negative interactions which could predict changes in psychological distress or it was psychological distress which could predict changes in the receipt of negative interactions over time. In the longitudinal analyses, it was shown how participants adjusted the way they interacted with their spouse, over time, according to their spouse's level of psychological distress. However, caution should be taken in interpreting these results; causal relationship cannot be inferred from these longitudinal results.

Lastly, this thesis distinguished between receipt of instrumental and emotional support. It once again proven in this thesis that, just like what Kleiboer et al. (2006) suggested, it is important to differentiate between receipt of instrumental support and receipt of emotional support. It was shown that receipt of emotional support had an influence on health outcomes, specifically on psychological distress, but instrumental support did not affect health outcomes.

7.3.2. Limitations

This thesis has a number of limitations which need to be noted. One limitation is that the only instruments used were self-report measures. For physical health in particular it would have been desirable to have had access to medical data (such as HbA1c levels).Moreover, although self-report data are commonly used and are a valid means of examining the participant's subjective realities, sole reliance on this kind of data might have increased the relationships among the variables. In addition, demand characteristics of the participants might have factored in the results.

It is also important to mention that measures of received social support assume that actual social support interactions have taken place. The current thesis asked participants to

rate the amount of support they received. These were subjective perceptions of supportive interactions, and recipient and provider may not always agree on how much support was exchanged (e.g., Abbey & Halman, 1995; Kleiboer et al., 2006). This may be because well-intended support may not be perceived as such by the recipient (e.g., Dakof & Taylor, 1990), or because supportive interactions go unnoticed (Bolger, Zuckerman & Kessler, 2000).

With regard to the subscale used to assess patient and partner treatment control perception, the obtained alpha levels were relatively low. Another limitation is that the medical history of the partners was not examined. One of the recruitment criteria was that the partner should not have been diagnosed with either type 1 or type 2 diabetes so that it would be clear that only one member would be designated as the patient and the other member as the partner. In a way it was assumed that the partner was healthy and was not experiencing any major illness. However, not being diagnosed with type 1 or type 2 diabetes does not necessarily guarantee that the partner was not diagnosed with other illnesses.

In the mediation analyses only those variables (attachment-anxiety and cyclical timeline illness perceptions) that were independently related to the outcome variables (i.e., whilst controlling for the other attachment dimension and illness perceptions, respectively) were examined as the independent variables in the models. This strategy was chosen to reduce the number of mediation analyses that were conducted in order to avoid capitalizing on chance. However, as a result attachment-avoidance and the other illness perception dimensions were not considered in the mediation analyses. Lastly, it should be noted that the study sample was not selected randomly; participants were recruited through advertisement and they voluntarily participated in the study. It is for this reason that the study sample may not truly be representative of the population. For example, patients and partners generally scored high on satisfaction with the support received, and low on negative interactions. As in

other studies examining couples coping with illness (e.g., Kleiboer et al, 2006) it is likely that distressed couples may have been less willing to participate, thus resulting in an underrepresentation of distressed couples. In addition, although there was some variation in relationship duration and time since diagnosis, most couples had been together a long time (mean relationship duration was 27 years) and had been coping with the diabetes for an average of 7 years. This may explain why health outcomes and social support interactions were relatively stable over time in the cross-lagged analyses. Future research should examine supportive interactions between patients and partners and how these interactions are influenced by attachment orientation and illness perceptions in a sample of more recently diagnosed patients and their partners.

7.4.Theoretical and practical implications

Findings of the current thesis support the idea in attachment theory that the attachment system does not only apply to child-caregiver relationship, but to adult romantic relationships as well. Secondly, the current thesis supports the attachment theory's prediction that attachment styles impact on caregiving behaviours. Lastly, attachment theory proposes that the comfort and security gained from enduring emotional bond formed between an individual and an attachment figure play a role in internal stimulation. The current thesis supports the implication of this proposition that attachment is linked to physical and psychological well-being.

This thesis' findings have important practical implications, especially for health practitioners designing an intervention program to help type 2 diabetes patients manage their illness efficiently while maintaining a high level quality of life. One very clear finding is that the partner plays a major role in the patient's well-being and that the patient's illness

contributes to the partner's health. This finding suggests that it will be beneficial for both patient and partner if the partner can also get the help that he or she needs in dealing with the patient's illness. Thus, it is recommended that health practitioners encourage the partner to seek out social support from family members, other than the patient, and from outside the family (e.g., friends, co-workers, and other people from the community). The finding that engaging in covert support seeking and receipt of negative interactions were the variables mediated between attachment and health outcomes, and illness perceptions and health outcomes, can motivate health practitioners to include behaviour modification relating to these behaviours in an intervention. Based on the other important findings of this thesis, practitioners can aim to strengthen positive behaviours of patients and partners and give feedback on behaviours that need to be modified. Results have shown that participants tended to adjust to their spouse's psychological condition by initiating less negative interactions over time; this is one of the positive behaviours that can be strengthened. On the other hand, it was also found that receipt of negative interactions were related to health outcomes more that receipt of emotional or instrumental support was. In relation to this, practitioners may give feedback to the couple on how to lessen initiating negative interactions. Training with regard efficient ways of seeking support may also be given to couples. Informing the couple about the relationship between attachment style and health outcomes and knowledge of their own and their spouse's attachment style may be advantageous as this can motivate them to monitor their behaviour and make the necessary changes to the way they interact with their spouse. Lastly, health practitioners may discuss with the couple the contribution of their illness perception on their well-being. It may be beneficial for the couple if they will be have a thorough understanding of the patient's illness as this may lead to having more positive illness perceptions.

There is a need to help couples be informed that the way they interact with each other as they cope with type 2 diabetes is related to their psychological well-being. For example, support seeking is related to both patient and partner psychological well-being, and that it is better to ask directly for help. Also they should be informed that initiating and /or engaging in negative interactions such as criticizing, nagging, or demanding is not an effective way of affecting changes in the patient's behavior. On the contrary, these are not helpful to both the patient's and the partner's well-being.

Furthermore, couples experiencing type 2 diabetes can be assisted with regard enhancing the quality of their supportive and in lessening their engagement in negative interactions.

7.5.Future directions

Based on the findings of the current thesis, there are a number of interesting directions for future studies examining the processes that couples go through as they deal with a chronic illness. I have grouped the discussion of recommendation for futures studies into: (a) attachment and illness perceptions, (b) relationship processes and inclusion of the partner, (c) supportive and negative interactions, and (d) methodological issues.

Attachment and illness perceptions. In the current thesis, I examined the mediating role of social support variables (i.e., supportive and negative interactions) between attachment-anxiety and health outcomes. In future studies, it would be good to look at how attachment variables moderate the relationship between social support variables and health outcomes. For example, it is possible that more securely attached patients benefit more from the social support their partners provide than insecurely attached patients do (Bachman and Bippus, 2005; Simpson et al., 2003).

I encourage future studies to look at the possibility of enhancing attachment security in couples dealing with a chronic illness and examine if this will bring about positive change in the way patients and partners cope with the illness. Mikulincer and Shaver (2007) suggested that an individual's attachment security can be increased and that this enhancement can lead to the person being more compassionate and altruistic. One way of boosting attachment security is by increasing the individual's sense of self-worth through cognitive priming (using loving and reassuring faces of people) (Mikulincer and Shaver, 2007). In the context of a couple experiencing chronic illness, can enhancing attachment security lead to providing more support and less negative interactions?

In a review of cross-cultural research involving fundamental principles of attachment theory, Rothbaum, Rosen, Ujiie, and Uchida (2002) suggested that the cultural context of a behaviour should be carefully taken into account when using attachment theory. I suggest that there be studies looking at possible cross-cultural differences when it comes to attachment variables in the context of coping with an illness.

Relationship processes and inclusion of the partner. The findings of this thesis has supported the result of other studies which point to the importance of including relationship processes, for example those highlighted in attachment theory (Pietromonaco et al., 2013) in examining patient well-being. It seems inevitable that future research will be including the partner and will be using dyadic data in understanding the other factors contributing to patient's experience of the illness and to patient well-being and quality of life. It is suggested that this kind of study be extended to studying patient adjustment and well-being in the context of other chronic illnesses. It is important that there are more (than what has already been conducted and has been added to the literature) studies closely examining the -different

mechanisms through which partners influence the quality of patients' coping and adjustment to illness, and the patients' well-being.

Another important direction that future studies can take is that of investigating further the role of patient variables on partner health outcomes. Ample research has shown that a chronic illness in one partner may have negative effects on the other partner's well-being and health outcomes (Sabone, 2008; Stodberg et al., 2007; Trief et al., 2003). However, most of the research looking at the impact on partners has focused on the impact of illness characteristics on partner outcomes. Very few studies have examined the impact of patient variables (i.e., personality, coping) on partner outcomes. One of the findings of the current study was that patients who were more anxiously attached had a spouse who experienced higher levels of psychological distress (both concurrently and over time). This finding illustrates the important role played by patient variables in partner well-being. To improve our understanding of how each partner's adjustment to coping with diabetes influences the other partner's adjustment and health outcomes it is essential to examine these 'cross-over effects', that is patient variables influencing partner outcomes and vice versa.

Supportive and negative interactions. In the current thesis, I looked at support received as reported by the participants, in future studies attention should be given to the association between attachment variables and the support provided by both patients and partners. For example, how providing (instead of receiving) support mediate the relationship between attachment variables and health outcomes. Collins and Feeney (2000) have explored the relationship between one's attachment and the support one provides, however this was not in the context of couples going through a chronic illness.

In addition, I suggest that there be more studies looking at the role of negative interactions on both patients' and partners' physical health and psychological well-being. It

will be useful to look at the possible reasons behind results in the literature and in the current thesis that negative interactions seem to be playing a bigger role in patients' and partners' health outcomes, particularly psychological distress, than supportive interactions. Qualitative studies can be conducted to study the different factors that may trigger patients or their partners to initiate negative interactions. Future studies can also look at other variables (for example one's stress level and relationship satisfaction) that might be associated with the exchange of negative interactions between patient and partner, and how to lower the likelihood that couples dealing with an illness engage in negative interactions.

Methodological issues. I recommend that there be more longitudinal studies to examine the bidirectional relationships of variables such as illness perceptions and health outcomes, psychological distress and management of type 2 diabetes. To be able to examine more clearly the changes over time, of support variables and health outcomes, possibly associated with attachment variables and illness perceptions, it is important to study patients and their partners closer to the time of diagnosis. This way, the adjustment process can be better captured at a more appropriate time.

The results of this study did not show significant findings with regard to physical health. I think it is important to look more closely at the relationship among attachment variables, support variables, and physical health by using an objective measure such as a physician's evaluation for both patients and partners, and blood sugar level of HbA_1c (glycated haemoglobin) for patients.

Longitudinal analyses of this study showed that partners higher on attachment-anxiety received more instrumental support six months after, which was not in accordance with the hypothesis that participants who scored higher on attachment-anxiety would report receiving less support. I think it is important to facilitate participants' accuracy in reporting support

variables. One of the ways through which this can be done is by using a diary study. For example, participants could be asked to answer a number of questions each evening for 14 consecutive days about the support received that day. This way, there is an increased likelihood that participants will be more aware of their own and their spouse's behaviours and will lessen their difficulty in recalling the frequency of these behaviours. Lastly, it will be better if other instruments, aside from self-report, are used to measure the variables.

Overall, the findings of this thesis provide evidence for two possible ways through which attachment and illness perception variables are related to health outcomes, particularly psychological well-being. One is through covert support seeking behaviour, and the other one is through the receipt of supportive and negative interactions. In addition, this thesis highlights the health aspect of the partners' experience in coping with their spouses' chronic illness and suggests that patient variables (specifically attachment and illness perception and support seeking and supportive and negative interactions) are important determinants of partner health outcomes in the same way that partner variables are factors related to patient health outcomes. This study may inspire more studies that are dyadic in nature, studies that will probe deeper into the role of support seeking and negative interactions in dealing with an illness, and more longitudinal studies that investigate the long-term implications of spouse supportive and negative interactions on the patients' and partners' well-being. In addition, the information contributed by this thesis may prove useful to health practitioners as they design programs to help couples effectively deal with a chronic illness.

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APPENDIX A: ETHICS APPROVAL

7 January 2007

Ms Louella B Orillaza
Department of Psychology
University of Canterbury
Private Bag 4800
Christchurch

Dear Louella Orillaza,

Working models of attachment, illness perceptions, and health outcomes in couples experiencing Type 2 diabetes: the mediating role of support-seeking and support-giving process
Investigators: L Orillaza, Prof G Fletcher
Locality: University of Canterbury
Ethics ref: URA/07/10/074

The above study has been given ethical approval by the **Upper South A** Ethics Committee. A list of members of this committee is attached.

Approved Documents
Information sheet dated 21 December 2007
Consent form for patients dated 15 November 2007
Consent form for partners dated 15 November 2007
Illness Perception Questionnaire dated 15 November 2007
Patient Questionnaire
Food record
Interview schedule
Advertisement dated 15 November 2007
Brochure 'Coping with Type 2 Diabetes in the relationship' dated 15 November 2007

Certification
The Committee is satisfied that this study is not being conducted principally for the benefit of the manufacturer or distributor of the medicine or item in respect of which the trial is being carried out.

Accreditation
The Committee involved in the approval of this study is accredited by the Health Research Council and is constituted and operates in accordance with the Operational Standard for Ethics Committees, April 2006.

Progress Reports

The study is approved until 15 January 2011. The Committee will review the approved application annually and notify the Principal Investigator if it withdraws approval. It is the Principal Investigator's responsibility to forward a progress report covering all sites prior to ethical review of the project in January 2009. The report form is available on http://www.newhealth.govt.nz/ethicscommittees. Please note that failure to provide a progress report may result in the withdrawal of ethical approval. A final report is also required at the conclusion of the study.

Requirements for SAE Reporting
The Principal Investigator will inform the Committee as soon as possible of the following:

- Any related study in another country that has stopped due to serious or unexpected adverse events
- withdrawal from the market for any reason
- all serious adverse events occurring during the study in New Zealand which result in the investigator breaking the blinding code at the time of the SAE or which result in hospitalisation or death.
- all serious adverse events occurring during the study worldwide which are considered related to the study medicine. Where there is a data safety monitoring board in place, serious adverse events occurring outside New Zealand may be reported quarterly.

All SAE reports must be signed by the Principal Investigator and include a comment on whether he/she considers there are any ethical issues relating to this study continuing due to this adverse event. It is assumed by signing the report, the Principal Investigator has undertaken to ensure that all New Zealand investigators are made aware of the event.

Amendments
All amendments to the study must be advised to the Committee prior to their implementation, except in the case where immediate implementation is required for reasons of safety. In such cases the Committee must be notified as soon as possible of the change.

Please quote the above ethics committee reference number in all correspondence.

The Principal Investigator is responsible for advising any other study sites of approvals and all other correspondence with the Ethics Committee.

It should be noted that Ethics Committee approval does not imply any resource commitment or administrative facilitation by any healthcare provider within whose facility the research is to be carried out. Where applicable, authority for this must be obtained separately from the appropriate manager within the organisation.

We wish you well with your study.

Yours sincerely

Alieke Dierckx
Upper South A Ethics Committee Administrator

Email: alieke_dierckx@moh.govt.nz

APPENDIX B: INFORMATION SHEET

College of Science

Department of Psychology
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www.psyc.canterbury.ac.nz

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Information Sheet

Research Project:

Coping with Type 2 diabetes in the relationship:
Receiving and giving social support and adjustment to illness in individuals with Type 2 diabetes and their partners

Goal of the research

Managing Type 2 diabetes is not an easy task. Most individuals with this illness need the support of their partners in coping with their situation. The goal of this research is to study how Type 2 diabetes patients and their partners support each other and how this influences the patient's adjustment to his/her illness. At present, there is not much information about the giving and receiving of support that happens in couples where one has Type 2 diabetes. This study will make an important contribution in this area of research and may be useful for practitioners (for example, therapists and social workers) in helping Type 2 diabetes patients and their partners adjust better to the illness. This study is a part of a PhD research.

Study requirements and procedure

We are looking for people who have been diagnosed (at least one year prior to this study) with Type 2 diabetes, and who would be willing to participate in the present study together with their spouse or partner. Fluency in English is required. If you and your spouse/partner agree to participate in this study, both of you will be asked to fill out a series of questionnaires at 2 points in time over the next 6 months. These questionnaires will ask about you and your relationship (e.g. your health and well-being, physical activities, beliefs about the illness, relationship quality, and giving and receiving support). A section of the questionnaire will ask you to record your food intake for two days. Each questionnaire will be completed at home and will take about 45 minutes to complete. You are not obliged to answer all of the questions: If there are certain questions that you are uncomfortable with, then you can skip them. The questionnaires will be sent to you through mail and a freepost envelope will be provided to send the questionnaire back to us. In addition, diabetes-related symptoms (only in patients) will be assessed on a daily basis (through a text message on your cell phone or a phone call to your land line if you do not have a cell phone), over a period of one week following the completion of both questionnaires. This will take only about 3 minutes per day. At 2 and 4 months after the completion of the first questionnaire, both of you will be asked to answer a short questionnaire by phone which will take about 5-10 minutes.

A week from now you will be contacted by the researcher, Louella B. Orillaza. She will check with you if you are happy to participate in this study. If you and your partner are willing to participate, she will then explain the format of the questionnaire and will be happy to answer questions or concerns that you might have.

Follow-up research

In addition to the questionnaire part of this study, we plan to interview 6 couples in more depth about their experiences with diabetes. In the questionnaire we will ask you and your partner to indicate whether or not you would be willing to be interviewed. If you are, there is a possibility that you and your partner will be invited to take part in the interview phase of the study. Participants who have very differing scores on the health outcome measures (diabetes-related symptoms, quality of life, and distress level) will be invited to the one- hour interview.

Participation and confidentiality

Your participation in this study is entirely voluntary (your choice). You do not have to take part in this study, and if you choose not to take part, this will not affect any future care or treatment. If you do agree to take part, you are free to withdraw from the study at any time, without having to give a reason and this will in no way affect your continuing health care. You may consult a friend, family or whanau support to help you understand the study and any other explanation you may require.

On completion of the first set of questionnaires (one set consists of a questionnaire for patient and a questionnaire for partner), the couple will receive a $35 gift card (from a selection of retailers) as a token of our appreciation. After the completion of the second set of questionnaires, the couple will receive another $35 gift card. Thus, at the end of the study, the couple would have received 2 $35 gift cards.

No material which could personally identify you will be used in any report on this study. All identifying personal and medical information will be kept secure and strictly confidential. Data will be stored for 10 years.

It is not anticipated that participation in this study will involve any risk to you. However, if at any time during participation in this study you experience distress of any kind and would like to talk to someone about your experiences, please contact Louella Orillaza or Dr Roeline Kuijer for advice regarding psychological assistance or other forms of assistance.

The project has been reviewed and approved by the Upper South A Regional Ethics Committee and the University of Canterbury Human Ethics Committee.

For more information

If you have any questions or concerns about your rights as a participant in this study, you may contact an independent health and disability advocate. This is a free service provided under the Health and Disability Commissioner Act.
Telephone: (NZ wide) 0800 555 050
Free Fax (NZ wide): 0800 2787 7678 (0800 2 SUPPORT)
Email (NZ wide): advocacy@hdc.org.nz

Please feel free to contact the researcher or supervisor if you have any questions about this study.

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APPENDIX C: MEASURE FOR SUPPORT SEEKING BEHAVIOUR

[Adapted from Support Activation Behavior Coding System (Barbee and Cunningham, 1990)]

When I have a problem or something is bothering me …	Never	Sometimes	Often	Very Often
1. I ask my partner for advice about what to do.				
2. I talk to my partner to find out more about the situation.				
3. I ask my partner to help me with the situation.				
4. I tell my partner that I need his/her help.				
5. I talk to my partner about how I feel.				
6. I try to get emotional support from my partner.				
7. I ask my partner to hug or comfort me.				
8. I discuss my feelings with my partner.				
9. I ask my partner to take my mind off things (for example, by telling a joke, talking about happy things).				
10. I ask my partner to do things with me to think about it less (for example, watch TV, go to the cinema, go for a walk).				
11. I try to mask my true feelings by making a joke about the situation when I tell him/her about it.				
12. I laugh about the situation when I tell him/her about it to cheer myself up.				
13. I avoid talking to my partner about it.				
14. I go very quiet when my partner asks me if something is bothering me.				
15. I refuse to talk about it when my partner asks me questions about the situation.				
16. I avoid looking directly at my partner when he/she asks me about the problem.				
17. I pretend that it doesn't bother me.				
18. I avoid being physically close to him/her when we talk about the situation.				
19. I tend to take my frustrations out on my partner.				
20. I complain to my partner about the situation, but I don't ask him/her for help.				
21. I get irritated with my partner.				

APPENDIX D: SUPPORTIVE AND NEGATIVE INTERACTIONS
(Adapted from van Sonderen, 1993)

In the <u>past week</u>, how often did <u>your partner</u>…	**Never**	**Some-times**	**Often**	**Very Often**
1. comfort you when you were feeling down?				
2. show you that he/she loved and cared for you?				
3. give you practical help?				
4. listen to you when you needed to talk about things that were on your mind?				
5. give you information or advice?				
6. show you that he/she appreciates you?				
7. spend time with you?				
8. take over some of your chores/responsibilities in and around the house?				
9. keep you company?				
10. offer suggestions or ideas as solutions to things that bothered you?				
In the <u>past week</u>, how often did it happen that <u>your partner</u> …	**Never**	**Some-times**	**Often**	**Very Often**
11. criticized you?				
12. was impatient with you?				
13. was angry or upset with you?				
14. seemed to avoid being around you?				
15. made too many demands?				
16. blamed you for things?				

All things considered, how satisfied were you with the support and help <u>you</u> <u>received</u> from your partner in the <u>past week</u>?

Not at all Satisfied	**A little satisfied**	**Moderately satisfied**	**Quite satisfied**	**Extremely satisfied**